RAILROAD GAZETTE

FRIDAY, NOVEMBER 22, 1895.

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Contributions.

Service Record of the Richmond Compound.

Richmond Locomotive & Machine Works,
RICHMOND, Va., Nov. 16, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

We have read with interest the leader in your current number and have felt with you that anything short of such a test of the compound as you propose is of no practical effect—that is, "a long continued road test in which the average performance may be taken as an accurate representation of service efficiency." In this connection the enclosed statement of two years' run of our compound No. 140 against 10 engines, all built by us at the same time, is the most satisfactory statement of the compound we have ever seen.

The facts are these: Three years ago we built 25 engines for the Chesapeake & Ohio Railway and asked the privilege of putting our compound device on one of them, making no changes whatever in boiler pressure or aught else but the front end. The engine was delivered in September, 1892, and save a change that was made at once of the valve from cast iron to bronze, no alteration has been made. We noted the performance with a great deal of interest, of course, with the result that later on we asked the privilege of compounding one of a number of C., C., C. & St. L. engines we were building, delivering it two years ago, since which time it has run continuously saving something like 400 tons of coal per annum over the other engines, as their reports show.

Sometime in 1894 Mr. Small, of the Southern Pacific, wrote to Mr. Morris, of the Chesapeake & Ohio, and asked him for a statement of his experience with the compound, whereupon Mr. Morris turned to his records and taking hap-hazard 10 of our build of engines sent him a report for the year 1893, comparing it with our compound, later on sending us a copy, this being the first information that we had of the matter. Subsequently, in the spring of this year, the C. & O. managers sent us a statement of the working of the engine for the year 1894, in comparison with the same engines as in 1893. These two statements we have consolidated as handed you herein. We understand the records are being kept for the current year, so it will be only a short time now when we can compare three years' work.

You will notice that our engine ran 85,000 miles against an aggregate of 700,000 of the simple engines, hauling full trains without extra cost for repairs.

W. R. TRIGG,
President Richmond Locomotive & Machine Works

PERFORMANCE OF TEN SIMPLE RICHMOND ENGINES AND RICHMOND COMPOUND NO. 140, IN SERVICE ON CHESAPEAKE & OHIO RAILWAY, 2 YEARS, TO DEC., 1894.

Engine number.	Engine mileage.	Loaded freight car mileage.	Cost of repairs.	Repairs per 100 miles run.	Tons of coal used.	Miles per ton of coal.	Average cars in train.	Pounds coal per Eng. mile	Pounds coal per car mile.
106	59,491	1,758,485	$1,634.05	$2.80	2,572	16.65	37.4	120	4.06
117	51,979	1,668,438	1,965.59	3.78	3,747	13.87	38.2	144	4.49
108	70,226	2,366,628	1,603.96	2.28	4,939	14.22	35.2	141	4.17
110	66,366	2,215,068	1,937.88	2.92	4,465	14.85	38.0	135	4.03
112	86,889	2,853,059	2,993.85	3.44	5,327	16.31	40.7	123	3.73
115	63,646	2,297,674	2,187.36	3.26	4,534	14.70	40.0	136	3.95
118	65,576	2,240,11 1	2,024.26	3.08	4,742	13 83	36 9	145	4.23
124	86,610	3,007 881	2,535.22	2 93	5,403	16.03	36.2	125	3.59
125	86,251	2,935 889	3,313.56	3.84	4,864	17.93	38.6	112	3.25
138	60,610	2,099.615	1,716.63	2 83	4,327	14.00	38 3	145	4.13
Total	700,664	23,502,808	$21,912 35	$3.13	45,930	15.25	37.5	131	3 91
Average of 10 simples.....	70,036	2,350,281	$2,194.24	$3.13	4,593	15.25	37.5	131	3.91
Compound No. 140	85,236	2,891,793	2 441.70	2.88	4,262	20.00	38.7	100	2.95
In favor of compound ..	.....	.....	.....	7.9%	.....	31.13%	3.5%	23 7%	24.5%

Long Distance Transmission at Portland, Ore.

General Electric Co.,
NEW YORK, Nov. 16, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the description of the long distance power transmission plant at Portland, Ore., an error has occurred which I desire to correct, and shall feel greatly obliged to you if you will make the correction in your next issue. I said in the article: "The four-wire system is worked at 1,000 volts between wires, and by means of feeder regulators a variation of four per cent. in either direction is covered."

This should read: "The four-wire system is worked at 133 volts between any two wires, and by means of feeder regulators a variation of 7½ in either direction is covered."

Yours truly,

F. MCGHIE.

Solid Floor Bridges.

NEW YORK, Nov. 17, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

After reading the article on "Solid Floors for Railroad Bridges," referred to in your issue of Nov. 1st, one more word on the subject seems excusable.

It is hardly consistent, to pace the radius of the circle, and then calculate its circumference to six decimal places; or to make a purely empirical assumption, and then, by refined mathematics, attempt to show concise results; but when the author *assumes* that the rail distributes 11 ft., and then calculates the proportional distribution of the load to three decimal places, he seems to have fallen into this error. Just why he should choose 11 ft. for distribution, instead of "three ties," as is the general practice in open floors, or instead of 30 ft. (full length of rail), he does not state. Thirty feet distribution, with a compound curve of flexure (instead of the simple curve which he uses) would more nearly conform to the uniformly distributed load desired.

It is not intended to argue against a solid floor where no other can be used. Its adoption there is its own apology. But what are the arguments for its *general* use?

(1.) The track on the bridge may be tamped as on the roadbed, and one does not know when the bridge is crossed.

With the open floor the surface is more perfect than can possibly be made on ballast. We do know when we cross a bridge by the more perfect motion. Is there any objection to this?

(2.) In open floors, shortening the space between drivers 12 in. has been known to increase the strains in floor beams 20 per cent.

The same change of spacing (from 5 ft. 6 in. to 4 ft. 6 in.) would *always* increase the strain in the trough of solid floors about 20 per cent., and this increase would not be confined to floor beams, but would extend to the *entire floor.*

(3.) A bridge should not be designed merely to carry a train on the rails.

On open floors, with ties 10 ft. long and trusses 14 ft. apart in the clear, a derailed train may increase the strain in the stringer 100 per cent. in addition to impact. On the solid floor a train derailed on a trough calculated to carry only .192 W. will increase the strain more than 500 per cent. in addition to impact of dropping from the rail. What becomes of our factor of safety and what becomes of the train? The bridge seems to be a veritable deathtrap.

It would seem humerous, if it were not so serious. In this vicinity we may carry our canes near the ferrule, turn up our trousers in dry weather, drive the tailless horse and teach him to fan the air with his fore feet; we may even advocate the right line column formula and the adoption of solid floor bridges, but we had hoped that our Western friends had escaped this contagion.

HENRY B. SEAMAN.

Machinery at the Atlanta Exposition.

The first inspection of the Machinery Building at the Atlanta Exposition is disappointing to one who expects to see much machinery of Southern manufacture. There is nothing of importance not sent from Northern states. A few machines made in the South may be found in the buildings, especially the Georgia or Manufacturers' Building, but they are rather crude in details and finish. The development of the New South in this direction is just beginning. The exhibits of natural products are numerous and varied, and show boundless resources awaiting the arrival of capital and labor for the enormous growth which must come in the near future. One cannot speak too highly of the enterprise of Atlanta and the faithfulness of the Exposition officers in getting together so much that is interesting, although the shrinkage below the standard set by the World's Fair, as noted in our issue of October 25, is very evident when the machinery is examined in detail. Northerners have not taken full advantage of the opportunity to show their manufactures to a region certain to develop rapidly.

The machinery is, as a rule, good of its kind and there are several notable exhibits. The steam for the entire system is supplied by a battery of Stirling boilers placed in a shed back of the Machinery Building. They form a very creditable exhibit in themselves. Some of the boilers are fitted with the Meissner stoker, others have plain grates; all have safety water columns supplied by the Reliance Gage Company, of Cleveland, O. Two feed water heaters, one, the Cochrane, by the Harrison Safety Boiler Company, and the other by C. E. Ferreira, of Chicago, are used with the system.

The machinery building is a handsome structure in a modified classical style. Its length is 486 ft., its width 100 ft. and the roof is about 30 ft. above the floors, well supported by trusses. The floor area is 47,800 sq. ft., every part of which is well lighted. Almost all the space is taken, although several of the exhibits were very late in getting into place.

The greatest amount of space is taken by the Worthington Pump Company, whose exhibit of pumps is most varied and noteworthy. Here may be found their large high-duty pump, as well as all other sizes down to one of the smallest capacity. All sizes of water meters are shown. The pumps are fitted with either the Fisher or the Mason governor, as they are used on the electric fountain in the center of the lake.

Near the Worthington's is placed a large exhibit of pumps and tobacco presses by the J. H. McGowan Company, of Cincinnati. The types, including deep well and high pressure pumps, are well shown, and some new features are brought out. The finish and completeness of all parts are well worth noticing.

The Knowles Steam Pump Works, of New York, have made a special point of the Bacon Patent Air Lift pump, which is in operation all the time. Several other small pumps are shown.

The above three companies are the only exhibitors of pumps, unless the Cameron and Deane pumps used for feeding the boilers are included in the list.

As might have been expected, considerable attention is paid to cotton machinery. There are four cotton gins, one by A. H. Davis, of Atlanta, and six exhibits of cotton mill machinery, of which the most noticeable are by the Woonsocket Machine & Press Company, of Woonsocket, R. I.; Geo. Draper & Sons, of Hopedale, Mass., and the Mason Machine Works, of Taunton, Mass. Among the smaller exhibits are a number of knitting machines, and looms and one cotton delinting machine, by the Cross Manufacturing Company, of Washington, D. C.

Even a casual visitor will notice at once the splendid display by the Singer Sewing Machine Company. Here are sewing machines of all descriptions and for all kinds of service.

The steam engines, are as a rule, of standard types, well built and handsomely finished. The straight line engine from Syracuse, N. Y., is made doubly interesting by a display of all the parts, showing the details of construction and fitting. The engine itself presents a clean, mechanical appearance very creditable to the maker.

The following builders of steam engines are represented by one engine of each type; Harrisburg Foundry & Machine Works, Lane & Bodley, Buckeye Engine Company, Frick Company, The Ball Engine Company, American Engine Company, Westinghouse Machine Company, Weston Engine Company and Houston, Stanwood and Gamble.

The only gas engine in the building is a vertical, four-cylinder engine, exhibited by the J. I. Case Thrashing Machine Company, of Racine, Wis. The novelty of starting the engine by means of a cartridge loaded with gunpowder is very well shown, and the refreshing part of the start is that there are no miss-fires. The same company have two smaller engines in the Transportation Building.

Among the attractive displays are the twist drills by the Cleveland Twist Drill Company and the Morse Twist Drill & Machine Company, and the saws by Henry Disston & Sons, the Simonds Manufacturing Company and the W. B. Barry Saw & Supply Company. Several exhibits of wood and metal-working tools add to the interest of the building, the Niles Tool Works Company and the Pratt & Whitney Machine Company ranking well above the others.

A few ingenious machines such as the Clough Corkscrew Machine, and the American Card Clothing Machine, attract crowds of spectators. Some printing presses and many small exhibits of methods of manufacture complete the list in the building, but no one should leave without seeing the beautiful model of cottonseed oil machinery and mill by the Buckeye Iron & Brass Works of Dayton, Ohio. The Economic Refrigerator Company, of Chicago, has, in connection with a number of refrigerators and a cooling room, a very good am-

monia ice machine. It is automatic and compact, requiring very little attention.

The exhibits of machinery are not confined to one building. The O. S. Kelly Company, of Springfield, O., have several steam road rollers placed under a shed near the upper end of the Lake. One of them has, in addition to the ordinary equipment, a small engine placed on the side for moving the front roller, and thus steering the machine with great ease.

The Georgia Manufacturers' Building contains eight exhibits classified under machinery. The first in point of position, being near the main entrance, is an automatic pump by Spencer S. Marsh, of Atlanta, Ga. It consists of two large buckets placed on the ends of a beam which is connected at its lower center with a small pump. By alternately filling the buckets, the pump may be driven to supply water at any elevation from a very low head. The machinery for two saw-mills is set up and operated for the entertainment of the public by the De Looch Mill Manufacturing Company, of Atlanta, and the Lombard Iron Works & Supply Company, of Augusta. The Columbus Iron Works Company has the most extensive display, consisting of corn mills, water wheels and ice machines.

In the fire building, located near the main entrance, are to be found several fire engines and apparatus for use in connection with fires. The American Fire Engine Co., of Seneca Falls, N. Y., and La France Fire Engine Co., of Elmira, N. Y., have exhibits; and the American Ball Nozzle Co. have a small separate building of their own.

The Manufactures and Liberal Arts Building contains several small exhibits of machinery, the most extensive of which is a set of water meters by the Thomson Meter Co., of Brooklyn, N. Y.

The Negro Building contains a great many manufactured articles, but little in the line of machinery. A small locomotive made by a negro is interesting, its chief recommendation being that it will go.

The Ice Palace in the Midway forms a great attraction for visitors, in that it is built of real ice, frozen by a refrigerating plant exhibited by the Stilwell-Bierce & Smith-Vaile Co., of Dayton, O.

Intercepting and Reducing Valves of the Rogers Compound Locomotive.

In the *Railroad Gazette* of Oct. 11 we gave a description and an engraving of one of the compound passenger engines built by the Rogers Company for Chile. We now give a detailed description of the reducing valve and the intercepting valve, these details having been changed since our description of the Rogers compound published March 17, 1893.

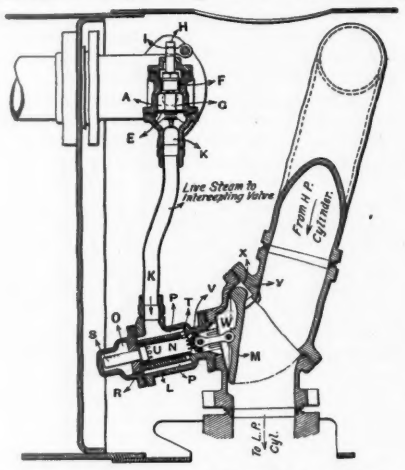
The description of the reducing valve is as follows: The steam in the dry pipe *B* (see small cut) has free access to the reducing valve chamber, *A*, through the pipe *Z*. The piston, *F F*, is 2½ in. diameter, and the valve, *E*, 3½ in., thus making the area of *E* twice that of *F*. The stem *G* connecting the two is $1\frac{7}{16}$ in. and hollow to lighten it. The maximum "drop" of the valve to the stop *D* is ¼ in. The chamber above *F* is open to the atmosphere through a 5/64-in. leakage hole at *E*. The stem *G* extends out through the case at *H* and has a slotted hole near its end into which a short arm, *I*, of the lever *J* (see small cut) is fitted, so that when the lever *J* is in its usual position (after starting) the valve *E* is held up on its seat, or "locked;" and when the arm *J* is free, as at starting, the stem *G* and valve *E* will then drop downward (¼ in.), provided the steam pressure below *E* (at *K*) is less than half that in *Z* (above *E*). This valve, when free, acts automatically, closing whenever the back pressure below it (in *K*) becomes half that above it, for the reason that it is then half balanced by back pressure, and as *F* pulls upward with a force equal to half the downward force on *E* the valve *F* is then "balanced" and closes on its seat. But as soon as the back pressure on its lower side (in *K*) falls below the balancing point it opens again as mentioned, or automatically. The arm *J*, in the small cut, is connected with a small quadrant, which is operated by the reverse lever, so that when the latter is at and near its extreme travel in either direction, the rod from this quadrant is relieved from tension and the lever *J* is free. The valve *E* is also free, to act automatically, and therefore, in starting, admits live steam from the dry pipe *B* to the low-pressure steam chest, before steam is received there from the high-pressure exhaust.

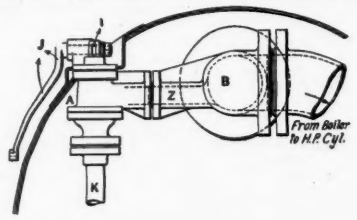
The metallic packing around the stem at *f* is merely to prevent any steam that might get through the piston from passing out alongside the upper end of *G* to the air, and causing it all to go out through *e* into the smoke-box. From the small "drop" (¼ in.) opening or closing the valve makes no noise or shock in operating.

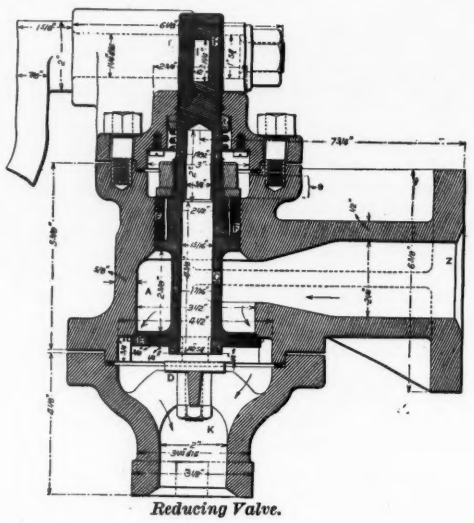
The steam passes down through *K* and the 2-in. pipe to the closing cylinder, *L*, at the intercepting valve, *M* (see small cut); *i*, *i* is the body of the cylinder, *L*, with an annular space, *P P*, around it, into which steam from the reducing valve flows when that valve is open in starting. In the cylinder, *L*, there is a loose fitting hollow piston, *N*, *N*, *N*, one end being connected to the valve at *M*, that valve being open when the piston is in the position shown. The other end of *N*, at *S*, is 1¼ in. in diameter and projects into a chamber, *O*, back of *P*, *P*, but connected with it by a 1/8 in. diameter hole at *R*.

The operation of closing *M* (see small cut) and admitting live steam to the low-pressure cylinder at starting is as follows: The reverse lever being at or near one or the other extreme of its movement, the lever *J*, in the small cut, and reducing valve *E* are "free." In opening the throttle, steam passes through *Z*, and by the valve *E* on down the pipe into the annular chamber *P P*. Some of it going through the 1/16-in. hole *R* into *O*, and the pressure on the 1¼-in. diameter end of the stem *S* then moves the piston *N* forward and *M* (see small cut) toward its seat across the receiver pipe.

From the annular space, *P*, *P* at *T* is a row of 8 5/16-in. holes, *n*, *n*, and in the back end of the hollow piston, *N*, at *U*, is a corresponding row of holes, *o*, *o*. When *N*, *N*, *N* has moved out toward *m* until its reduced part *gh*, arrives at the holes *n n* (when the intercepting valve is half closed) steam then begins to flow through this reduced part, *gh*, from the holes *n*, *n*, giving it relief, and through the holes *o*, *o*, *o*, and out into the passage to the low-pressure cylinder steam chest through the holes *c*, *c*, at *V*, which, when *g* has arrived at the holes *n*, *n*, are outside the cylinder at *W*. As *N* moves on until the holes *o*, *o*, *o*, correspond with, *n n*, when the intercepting valve is closed, the steam from the reducing valve then has full openings to pass to the low-pressure cylinder steam chest. Any leakage from the chamber

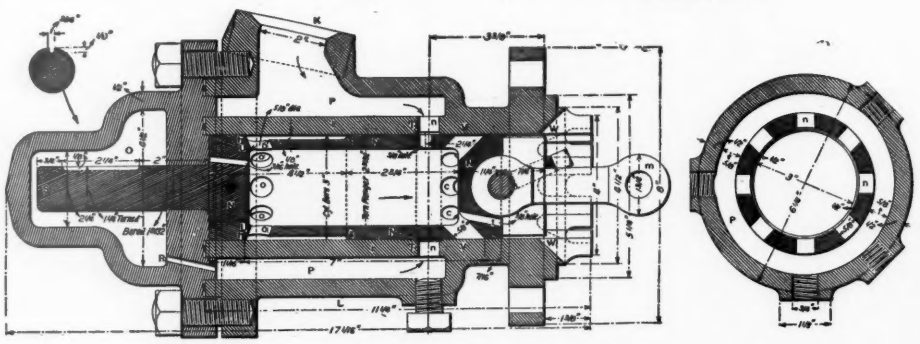






Reducing Valve.

P P does not affect the movement of *N*, as it is under balance and the force to move it to close *M* all comes from the pressure on the end of *S*, so that *M* closes without any injurious "shock." *N*, on its outside, at *S*, for 2¼ in., is reduced to 1/8 in. smaller than at the ends to give "leakage" space, to "ease" the closing of *M* and to allow more or less steam to pass through without closing *M*, in case of a slight release at intervals of *E*. Whenever *E* closes *M* falls open again of its own weight. The hinge of *M* rests in boxes at *X* (see small cut), which have a slight movement space in the direction of *Y*, so that *M* always gets a perfect bearing on its seat.



Intercepting Valve.

Intercepting and Reducing Valves, Rogers Compound Locomotives.

The "locking" arrangement of *E* by the lever *J* in small cut, and the quadrant referred to is to prevent all unnecessary opening of *E*; for instance, when running if the throttle is closed, or partially closed, and then opened again, if free, *E* would open and let more or less live steam pass through until the back pressure in *K* from the receiver caused it to close again, thus causing a frequent and unnecessary action of *E*. The "locking" arrangement, however, effectually prevents that.

The reduced port of the hollow piston *NN* (from *g* to *h*) permits the low-pressure cylinder to be "fed" with high-pressure steam from the reducing valve at very slow speeds; in starting a heavy train, for instance, when the intercepting valve is about half way open, or less, so that at such time if the low-pressure cylinder steam chest does not get a pressure from the high-pressure cylinder exhaust equal to one-half the pressure going to the high-pressure cylinder from the dry pipe, the difference (deficiency) will pass the reducing valve, the holes *nn* and the reduced part *g* to *h*, through the holes *oo*, and out to *W* through the holes *cc*. This takes place when the intercepting valve is anywhere between being closed and half way open, so that the receiver pressure may be aided by that "route" up to half the pressure in the high-pressure steam chest if the reducing valve is "unlocked," but no more than that. Therefore, the low-pressure cylinder can never get over pressure, but can get half that in the high pressure cylinder.

The 1/8-in. hole in the hollow piston at *R* and another at *t* together form a free passage from the space at *W* in the receiver pipe passage to *P P*, and underside of the reducing value. The object of this is to allow the pressure to equalize itself between that below the reducing valve and that at *W* (in receiver), without disturbing and causing more or less useless movement of the piston *N N*, that would otherwise be caused by the changes in pressure that are constantly occuring in the working of the engine. With this opening through the piston and its attachments they remain motionless in service as long as the reducing valve remains "locked." The arrangment, as shown, makes the closing of the intercepting valve free from any injurious shocks, and noiseless. It is to be noted that there are no packing rings used, the "fits" are all loose except the one at the 2½-in. diameter piston *F*, which has the usual steam-tight packing rings. The valve *E* is like a common safety valve, opening downward from its seat. The joints in the cylinder *L* are all loose, as leakage there within reasonable limits is no objection.

When *M* is closed on its seat and the exhaust from the high-pressure cylinder brings a pressure of less than ½ lb. per square inch on it, *N* will be pushed back and *M* will open, as the pressure on the end of *S* is all that is necessary to overcome in doing it, as the piston *N*, receiving the pressure from all points around it, is always in balance.

Rogers Locomotives at Atlanta.

We illustrated last week one of the three passenger locomotives which are exhibited by the Rogers Locomotive Co., at the Atlanta Exposition. The remaining two we illustrate in the accompanying engravings. These two engines, which are both 10-wheel passenger engines, were made for the Louisville & Nashville Railroad and the Plant System respectively. They are both intended for bituminous coal and have three pairs of drivers each. The boiler of the L. & N. locomotive is of the Belpaire type, while that of the engine for the Plant System has an extended wagon top boiler. The working steam pressure in the case of the former engine is 170 lbs., and in the case of the latter 200 lbs. Both tenders are equipped with diamond trucks. The general dimensions of the engines are given below:

LOUISVILLE & NASHVILLE LOCOMOTIVE.

Description.

Gage	4 ft. 9 in.
Fuel	Bituminous coal
Weight on drivers	109,400 lbs.
" " truck wheels	37,600 "
" total	147,000 "
Wheel base, total, engine	24 ft. 3 in.
" " driving	13 " 3 "
" " total (engine and tender)	50 " 11 "
Height, center of boiler above rails	8 " 5 "
" of stack	15 " 0 "
Heating surface, firebox	182 5 sq. ft.
" " tubes	1,852. "
" " total	2,034.5 "
Grate area	28. "

Wheels and Journals.

Drivers, number	6
" diameter	69 in.
Truck wheels, kind	Paige plate, center, steel tired
" " diameter	36 in.
Journals, driving axle, size	8 × 10½ "
" truck " "	5¼ × 10 "
Axles, driving material	Hammered iron
" truck "	" "

Cylinders.

Cylinders, diameter	19½ in.
Piston, stroke	26 "
" rod, diameter	3½ "
Kind of piston rod packing	U. S. metallic
Main rod, length center to center	9 ft. 7 in.
Steam ports, length	20 "
" " width	1¼ "
Exhaust ports, length	20 "
" " width	3 "
Bridge width	1½ "
Exhaust pipe	Single high

Wheels, diameter	33 in.
Axle, material	Hammered iron
Journals, size	4¼ × 8 in.

PLANT SYSTEM LGCOMOTIVE.

Description.

Gage	4 ft. 8½ in.
Fuel	Bituminous coal.
Weight on drivers	110,000 lbs.
" " truck wheels	40,000 "
" total	150,000 "
Wheel base, total, engine	24 ft. 9½ in.
" " driving	13 ft. 6 "
" " total (engine and tender)	52 ft. 2 "
Height, center of boiler above rails	8 ft. 9½ "
" of stack above rails	15 ft. 9 "
Heating surface, firebox	187.5 sq. ft.
" " tubes	2,121.5 "
" " total	2,309 "
Grate area	35.35 "

Tubes.

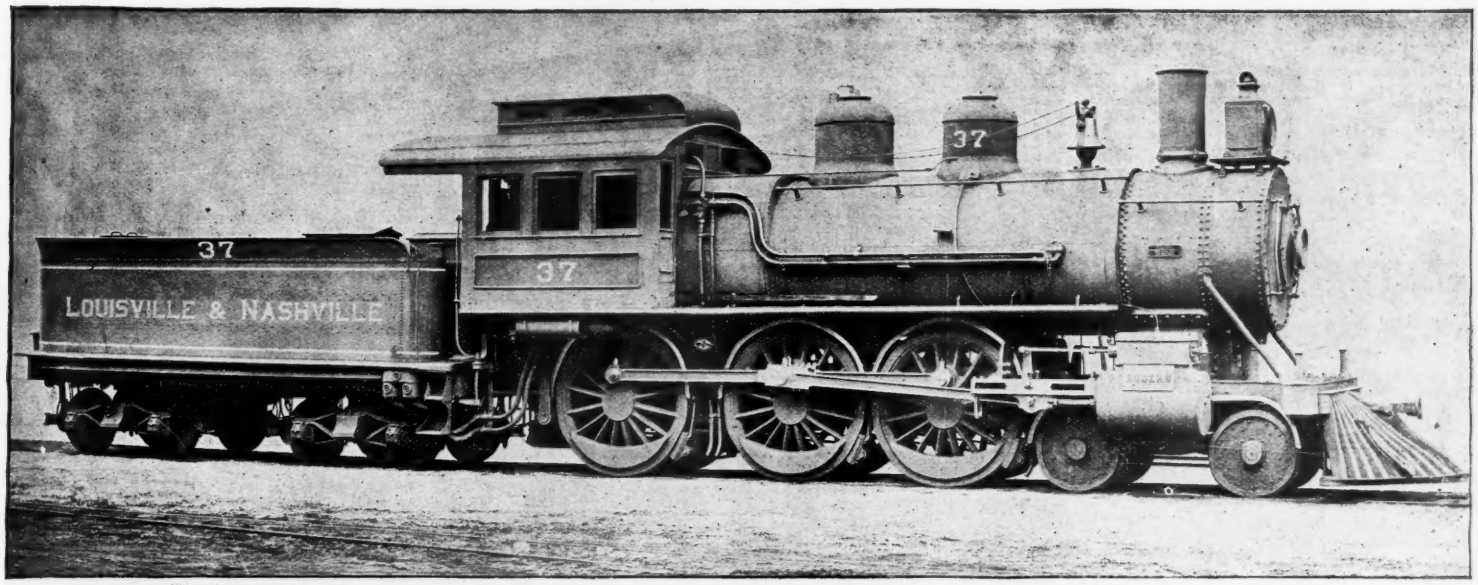
Tubes, number	261
" material	Lap welded C. I.
" outside diameter	2¼ in.
" length over sheets	13 ft. 10⅞ in.

Firebox.

Firebox, length	10 ft. ¾ in.
" width	3 " 5⅞ "
" depth front	75¾ "
" " back	66¾ "
" material	Steel
" thickness of sheets. Crown ⅝, back and sides $\frac{5}{16}$, tube ⅛ and $\frac{7}{16}$ in.	
" brick arch	Supported on four 3 in. O. D. iron pipes
Grate, kind of	C. I. rocking finger bars with drop plate at front.

Tender.

Tank capacity	4,200 gals.
Coal capacity	6 tons
Frame, type of	9-in. steel channels
Trucks, "	Diamond



TEN-WHEEL PASSENGER LOCOMOTIVE FOR THE LOUISVILLE & NASHVILLE, EXHIBITED AT THE ATLANTA EXPOSITION.

Made by the ROGERS LOCOMOTIVE COMPANY, *Paterson, N. J.*

Valves.

Valves, kind of	Margach's Balanced
" greatest travel	6 in.
" outside lap	1 "
" lead in full gear	$\frac{1}{16}$ "

Boiler.

Boiler, type of	Belpaire
" working steam pressure	170 lbs
" material in barrel	Steel
" thickness of material in barrel	$\frac{13}{16}$ in.
" diameter of barrel outside at first course	66 "
Seams, kind of horizontal	Quadruple riveted, Butt joints
" " circumferential	Double riveted
Crown sheet stayed with	Stay bolts
Dome, diameter inside	30⅞ in

Wheels and Journals.

Drivers, number	6
" diameter	72 in.
Truck wheels, kind	Snow's boltless spoke tender, steel tired
" " diameter	36 in.
Journals, driving axle, size	8½ × 10 "
" truck " "	5½ × 12 "
Axles, driving material	Coffin toughened steel
" truck "	Hammered iron

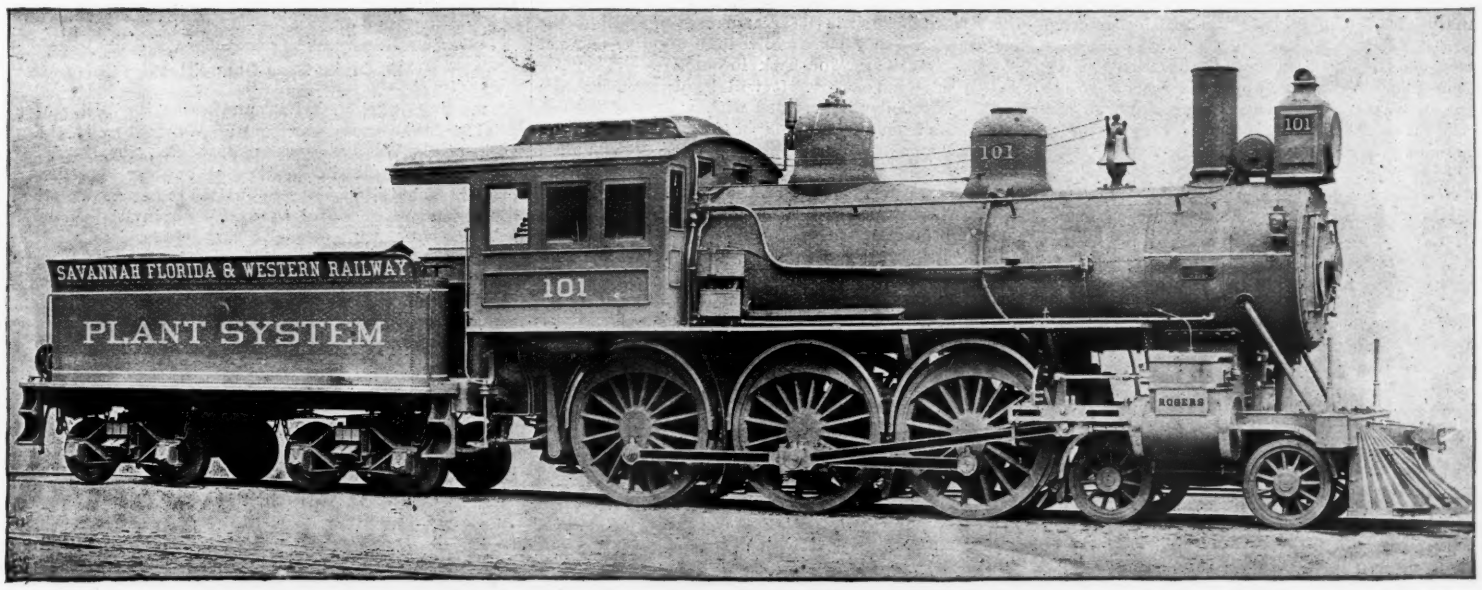
Cylinders.

Cylinders, Diameter	20 in.
Piston, stroke	24 "
" rod, diameter	3½ "
Kind of piston rod packing	U. S. metallic
Main rod, length center to center	10 ft. 4⅞ in.

Wheels, kind	Snow's boltless, solid center, steel tired
" diameter	33 in.
Axle, material	Hammered iron
Journals, size	4½ × 8 in.

The New Four-Cylinder Compound Locomotives of the Paris, Lyons & Mediterranean.

Several times in the last three years we have noted the preparation to introduce on the Paris, Lyons & Mediterranean Railroad of France a new type of express passenger locomotives, and about a year ago we gave a small



TEN-WHEEL PASSENGER LOCOMOTIVE FOR THE PLANT SYSTEM, EXHIBITED AT THE ATLANTA EXPOSITION.

Made by the ROGERS LOCOMOTIVE COMPANY, *Paterson, N. J.*

Tubes.

Tubes, number	264
" material	Iron
" outside diameter	2 in.
" length over sheets	13 ft. 5 "

Firebox.

Firebox, length	10 ft. 2¼ in.
" width	2 " 8⅞ "
" depth front	73¼ "
" " back	63¼ "
" material	Steel
" thickness of sheets	Crown, ⅜ in.; sides and back, $\frac{5}{16}$ in.; tube, ⅛ in.
" brick arch	Supported on studs
Grate, kind of	C. I. rocking finger bars with drop plate at front

Tender.

Tank capacity	4,200 gals.
Coal "	7 tons
Frame, type of	White oak
Trucks "	Diamond
Wheels, kind	Krupp's C. I. double plate center, steel tired

Steam ports, length	20 in.
" width	1⅝ "
Exhaust ports, length	20 "
" width	3¼ "
Bridge, width	1½ "
Exhaust pipe	Single high

Valves.

Valves, kind of	Allen-Richardson
" greatest travel	6 in.
" outside lap	1⅛ "
" clearance	$\frac{1}{8}$ "
" lead in full gear	$\frac{1}{16}$ "

Boiler.

Boiler, type of	Extended wagon top
" working steam pressure	200 lbs.
" material in barrel	Steel
Boiler, thickness of material in barrel	$\frac{5}{16}$ and $\frac{9}{16}$ in.
" diameter of barrel outside at first course	66 "
Seams, kind of horizontal	Quadruple riveted, butt joint
" " circumferential	Double riveted
Crown sheet stayed with	Radial stays
Dome, diameter inside	29⅝ in.

illustration of one of these engines, not unlike the perspective view shown in this issue.

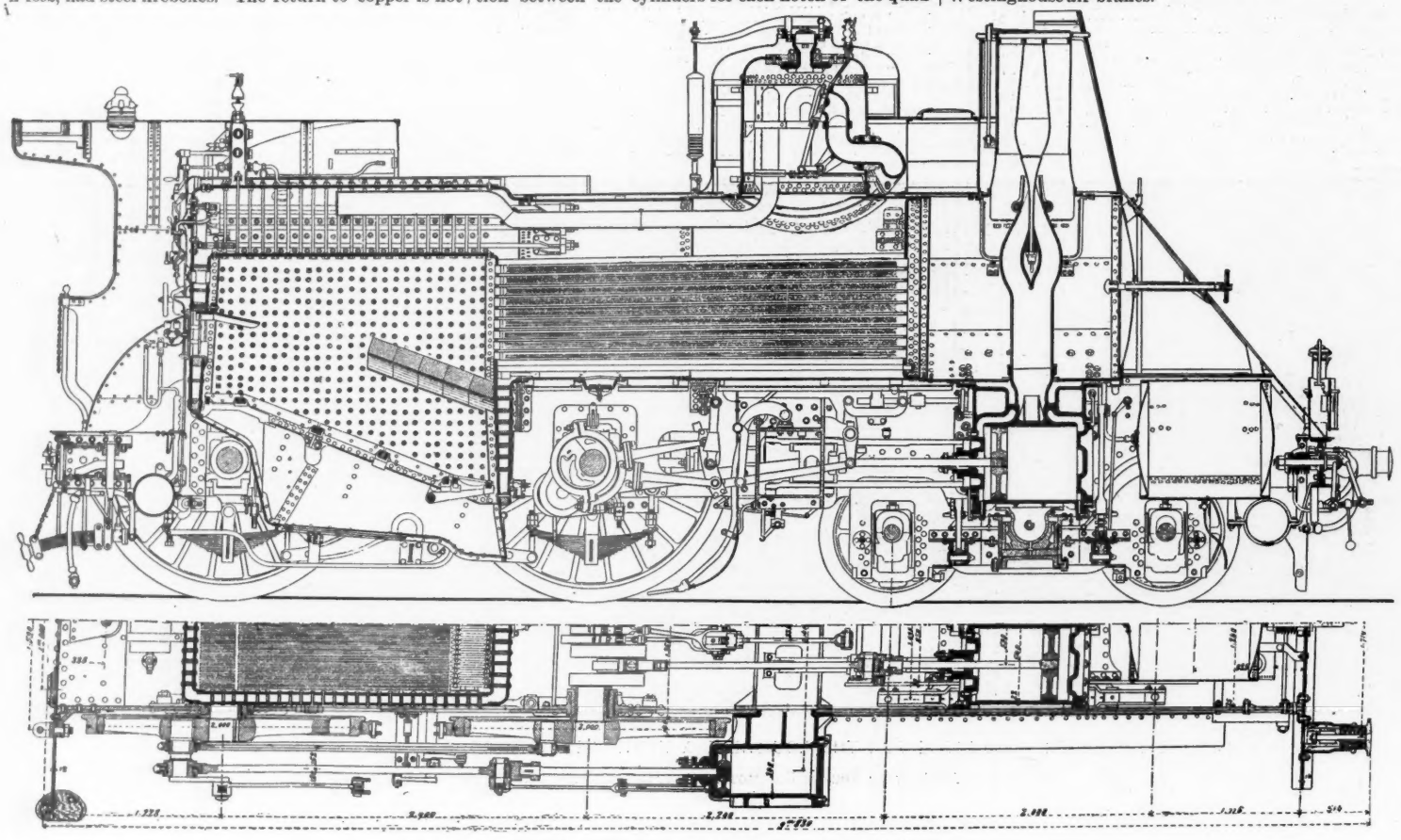
During 1894 the Paris, Lyons & Mediterranean put in service 40 of these locomotives with the result that it has been possible to increase the speed of trains without lightening the loads, and to reduce the time between Paris and Marseilles to 13 hours. The distance is 863 kilometers and the former express time was 14½ hours. It will be observed that the new engines make fair speed, their average at 13 hours for the journey being 41 miles an hour.

This new type was designed under the supervision of Mr. C. Baudry, Chief Engineer of Material and Motive Power, and is a slight modification of some experimental engines put in service in 1892. The locomotives have four cylinders lying in a horizontal plane, two high

pressure cylinders outside the frames, connected to the rear drivers, and two low pressure cylinders inside, connected to the forward driving axle. It will be observed that the drivers are coupled.

The boilers are provided with the Serve tube, and the fireboxes are of copper. The experimental engines, tried in 1892, had steel fireboxes. The return to copper is not to be considered, however, as an abandonment on the part of the company of experiments with steel, for a score of steel fireboxes are still running and under observation. Although the experience so far has been favorable to steel, it seemed only prudent in building these new engines to stick to a practice which years have proved to be a good one. Except the fireboxes the boilers are entirely of steel, including the tubes. These tubes number 133, 9 ft. 10 in. long and 2.56 in. external diameter.

The new engines have been made slightly heavier, not only in the boilers, but in the frames and various other parts, than were the experimental engines put in service in 1892; that is, the total weight in working order has been increased from 105,402 lbs. to 111,320 lbs.



The New Compound Locomotives of the Paris, Lyons & Mediterranean.

(Dimensions in Meters.)

The volume of the high pressure cylinders as compared with the low pressure is 0.4, which is the same ratio that was given to the cylinders of the experimental engines. The steam connections, however, from the boilers to the small cylinders, and between the low pressure and high cylinders have been considerably changed. In place of giving these connections considerable development inside the smokebox they have been made as short and as direct as possible, and the idea of reheating the steam in the smokebox has been abandoned. The valve movement for both high and low pressure cylinders is the Walschaert.

The reversing gear is worked by steam; it controls the four valves at once and is arranged to give a fixed relation between the cylinders for each notch of the quadrant and quite independent of the will of the driver. The arrangement for admitting steam directly from the boiler into the receiver between the high and the low pressure cylinders, at the moment of starting, is a simple cock placed in the cab. A safety valve on the receiver is set at six kilograms per square centimeter (85.3 lbs. per sq. in.). With this arrangement the starting is always easy.

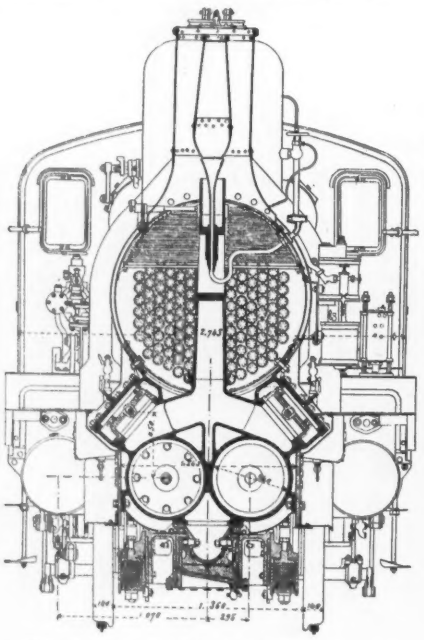
The external characteristic of these locomotives which first strikes the view is the arrangement to minimize air resistance, and they have received the popular name of "locomotives à bec," or beak locomotives. They are also called wind cutters. It will be observed that the front of the boiler is provided with a prow. The cab also has its front surface brought forward to an angle; the smoke stack, the dome and the sandbox are all united in a common housing which runs to a point aft of the dome as well as forward of the stack. This idea of diminishing the air resistance of the locomotive by a prow and smooth housings is not new, but this is the first important application of it. No reports have been received which give any measure of the benefit derived; but the whole scheme appears to us frivolous in theory and unmechanical and awkward in appearance.

Inside the smoke stack will be observed a central core, according to the general usage on this railroad, placed above the exhaust nozzle, and designed to spread the discharge from the exhaust. The exhaust nozzle is rectangular in cross-section, and is varied by means of movable flap valves, as shown in the longitudinal sectional view. The blower ejects steam into the smokestack by rows of small holes pierced through the central core. This arrangement will be apparent from Fig. 3.

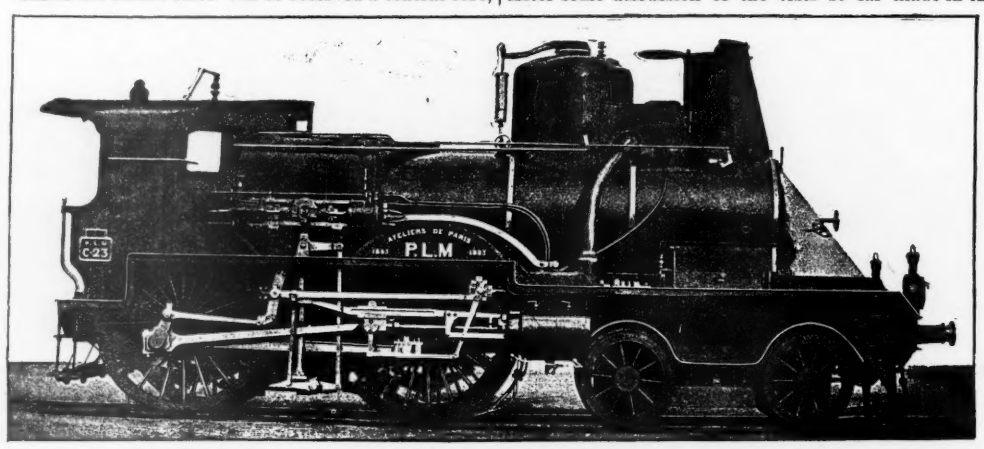
Two Sellers injectors are used. The lubrication of the cylinders is by means of a lubricator acting by screw compression worked by hand. The pistons are cast iron, the piston rods steel, as are the connecting and coupling rods. The axles are steel and the wheels wrought iron with steel tires. The driving wheels are provided with Westinghouse air-brakes.

Following are some of the principal dimensions:

Grate surface	25 6 sq. ft.
Total heating surface	1593.2 "
Ratio of total heating surface to grate surface	62.21
Diameter of boiler	52 in.
Length of boiler	9 ft. 6 "
Inside diameter of smoke stack	21.3 "
Diameter of central core	10.6 "
Diameter of driving wheels	6 ft. 6.7 "
Diameter of truck wheels	3 " 3.4 "
Diameter of cylinders, high pressure	13 4 "
" " low "	21.3 "
Stroke	24.4 "



The P., L. & M. Compound Locomotives.



The P., L. & M. Compound Locomotives, with "Air-Cutting" Housings.

The Brake Shoe Committees.

A meeting of the M. C. B. Committe on the best material for brake shoes was held at Wilmerding at the works of the Westinghouse Air Brake Co., Nov. 12. All brake shoe makers who are known by their advertisements in technical papers were invited to be present. If any manufacturer failed to receive an invitation the oversight was not intentional. The object of the meeting was to secure from the makers of brake shoes such suggestions and opinions as they might have to give. The joint committees are apparently trying to leave no ground for criticism when the final report is made. After some discussion of the tests so far made in the shop and in service on several railroads, the following resolution was offered by the brake shoe manufacturers present. This was done after a discussion among themselves of all matters pertaining to the road and shop tests so far made:

"It is the unanimous opinion of the representatives of the Brake Shoe Manufacturers who have inspected the apparatus and viewed the tests to-day that the methods

used and the results obtained are very gratifying. We believe the committees in charge of the tests are accomplishing results of the highest practical value, and we are prepared to co-operate with them to the fullest extent. In connection with the tests which are yet to be made, we suggest that the committees specify formulæ for what are known as "hard" and "soft" iron and steel shoes, and we suggest further that the committees take such observations as will indicate the effect upon steel-tired wheels of the various shoes tested."

In a joint session of the committees after the general meeting it was decided to determine, if possible, some simple method of distinguishing between "hard" and "soft" cast iron and steel shoes.

The work of the road test committee will probably not be extended farther than it was carried last year. The work of the shop test committee was resumed about the first of last September, and is still in progress. Much has been done since last year's report, and we learn that the results are important and very satisfactory to both committees. Last year's report contains important data bearing on the friction of metals without lubrication and under heavy pressures.

The following members of the committee were present at the meeting: S. P. Bush, Superintendent of Motive Power Pennsylvania Lines west of Pittsburgh and Chairman of the Shop Test Committee. R. H. Soule, Superintendent of Motive Power Norfolk & Western Railroad, Chairman of the Road Test Committee; John W. Cloud, Secretary Master Car Builders' Association, and D. L. Barnes, of the *Railroad Gazette*. The following brake shoe manufacturers were represented: American Steel Castings Co., The Sargeant Co., The Ramapo Iron Works, Corning Brake Shoe Co., Schoen Manufacturing Co., Composite Brake Co., Lappin Brake Shoe Co. Also were present Mr. H. H. Westinghouse, General Manager of the Westinghouse Air Brake Co., and Mr. F. W. Sargeant, formerly Engineer of Tests of the Burlington road. Mr. Sargeant, it will be remembered, made the brake shoe tests with the dynamometer car and testing machine at Aurora which were reported some years ago to the Master Car Builders' Convention.

This large representation of interested parties indicates to some extent the value of the work being done and the importance of the subject. More than 1,000 tests have been made on the test machine at Wilmerding and the results, it is said, corroborate what has been found in action in actual service.

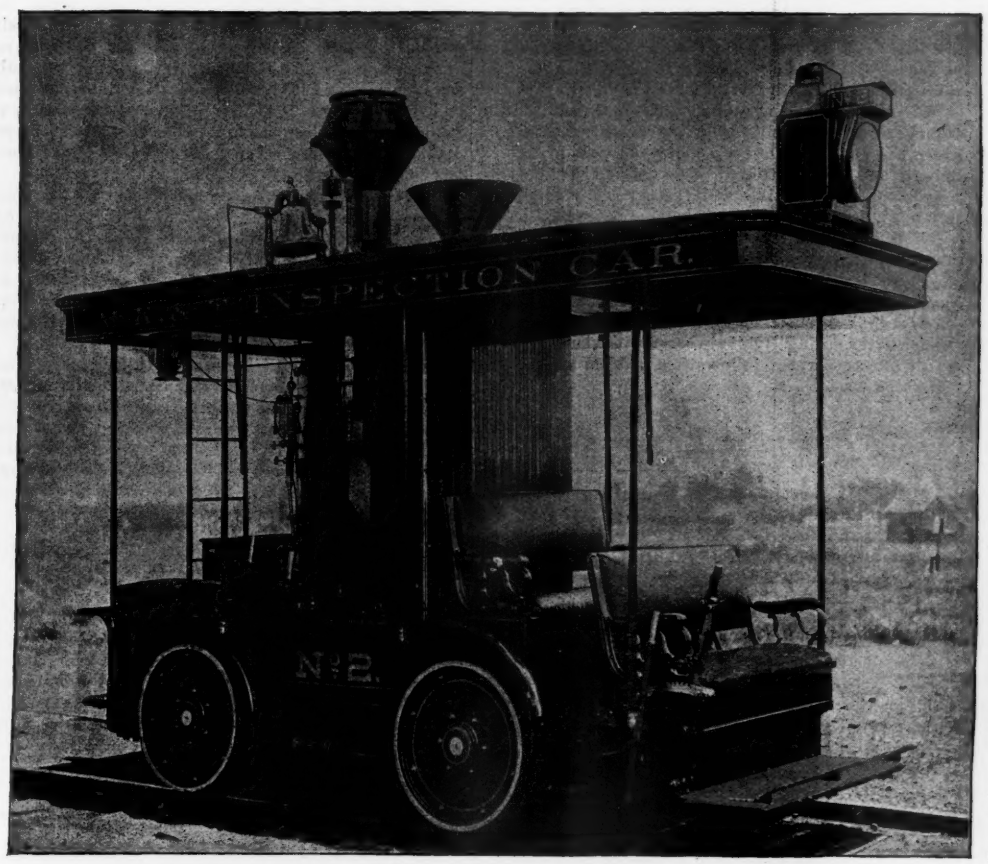


Fig. 1.—M., K. & T. Inspection Car.

An Inspection Car for the M., K. & T.

Through the courtesy of Mr. Wm. O'Herin, Superintendent of Motive Power of the Missouri, Kansas & Texas, we give a photograph and drawings of an inspection car in use on that road. This car was built at the railroad shops at Parsons, Kansas. It can be operated from either end, having a duplicate throttle lever, reverse lever, brake valve, etc. There is room in the front seats for six persons, and there are seats in the rear for a conductor and an engineer. When making inspection trips, the car is handled by the General Manager from the front seat. A speed of 35 miles an hour is readily obtained under full load.

The car is equipped with lockers for the storage of engineer's instruments, blue prints, track levels, gages, etc., and necessary oil and supplies; and is provided with an ice box, water cooler and other conveniences for the comfort of the inspectors. It has the Davis pinch handle window shades, and a full set of storm curtains with glass windows for observation when running during rain storms. The water-tank, which is placed immediately behind the front seats, is covered with strips of black walnut and ash, and has a gage glass extending from the top to the bottom. It is filled from the top as shown by Figs. 1 and 2. The boiler is vertical and has 61 1½-in. tubes. There are steam brakes and a Boyer speed recorder.

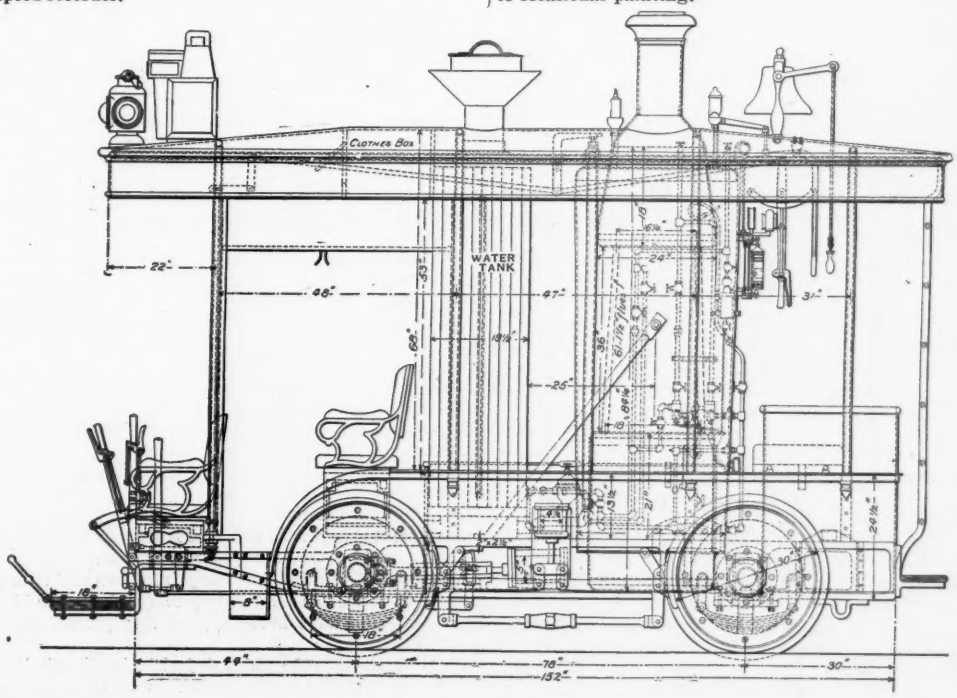


Fig. 2.—Elevation of Inspection Car.

The accompanying table gives the principal dimensions.

Gage of road	4 ft. 8½ in.
Weight of car in running order	11,400 lbs.
Diameter of wheels	30 in.
Kind of wheels, wrought iron center, steel tired	1½ in. thick
Wheel base	6 ft. 6 in.
Diameter of cylinder	5 "
Stroke of cylinder	8 "
Outside diameter of boiler	39 "
Size of grate	25 in. diameter
Number of tubes	61
Length of tubes	36 in.
Diameter of tubes	1½ "
Square feet of grate	3.4
Square feet of firebox heating surface	12.6
Square feet of tube surface	60
Total heating surface	72.6
Size of steam ports	½ in. × 3 in
Size of exhaust ports	1 in. × 3 "
Throw of eccentric	⅞ "
Travel of valve	1¾ "
Steam lap	¼ "
Exhaust lap	0
Coal capacity	1,000 lbs.
Water capacity	180 gals.
Brakes, pull up steam brake, cylinder	4½ in. diameter

Fig. 3 is a detail of one of the cylinders, which are 5 in. × 8 in., and Fig. 4 shows the arrangement of the valve gear. The cylinders are unlike ordinary locomotive cylinders which have a saddle for the front end of the boiler to rest upon. As is seen in Fig. 3, the usual cored passage to admit steam to the steam chest is omitted, and the steam is piped directly into the chest. The exhaust is on the top, through a 1¼ in. pipe and the steam chest is on the side. This is shown better in Fig. 4, where the location of the cylinder with respect to the frame is given. The valve gear is between the cylinders and nearest wheel, the link hanger being fastened to the shorter arm of a bell crank, whose arms are 8 in. and 14¼ in. long. The reach rod connects with the longer arm. The axle is cranked, with a 3¾ in. × 2½ in. bearing for main rod.

In Fig 5 is shown an external view and section of one of the main wheels, which are of a somewhat novel design. They have a steel tire, $\frac{5}{16}$ in. thick, steel plates and a cast iron hub. The plates are bolted to the hub with eight ¾ in. bolts, and also to the tire by an equal number of similar bolts. Between the plates is a wooden filler, $1\frac{3}{16}$ in. thick, a portion of which is cut away, as shown in Fig. 5, and 28 lbs. of lead is poured in hole *C* as a counterbalance. The standard M. C. B. flange and tread is not used, but instead the flange is 1 in. high, 1 in. thick and has a ⅝ in. throat radius.

Painted or Planished Iron Jackets for Locomotives.

At the October meeting of the New York Railroad Club a subject was introduced and discussed which is of considerable practical importance, although one of the minor matters. Mr. E. E. Russell Tratman presented a paper on the Use of Painted or Planished Iron Jackets for Locomotives, which was the result of one of those painstaking investigations into practice here and abroad which Mr. Tratman is fond of making. He concludes from his inquiries that if painted jackets are adopted with a view to economy they may be made far more economical than planished jackets, but the mere substitution of painted jackets will not necessarily insure economy, as the painting may be too fine for actual needs.

The planished iron jacket is necessarily expensive in first cost, requires care, the metal soon gets battered, drippings from the roof eat away the enamel and the surface gets shabby. A much cheaper quality of iron may be used for a painted jacket, the painting may be done cheaply and yet be fairly durable, look fairly well and cost little for maintenance. One starts with cheaper but equally good material as a foundation and can then make the jacket as expensive as the needs of the individual road demand. A painted jacket will last as long as the boiler, the expense for maintenance being limited to occasional painting.

The inquiry embraced quite a number of railroads which we will take up individually. On the Chicago, Burlington & Quincy the necessity for severe economy has introduced the principle that appearance is not of great importance and an engine is never shopped merely to paint it for the sake of good looks. The painting has been brought down to a basis of strict economy; engines are painted like bridges, simply to preserve them. Three or four years ago planished iron jackets were abandoned and pickled, cold-rolled steel adopted, painted with one coat of Roger's black. Planished jackets live about five or six years and then begin to show bright spots and formerly were renewed when in this condition. Now the old planished, iron jackets are painted black and will probably give five years more service. Painting makes a saving in material and labor, and it is not

necessary now to tallow the jackets in wet weather. The relative cost of the two kinds of jacket for an 8-wheel engine is given by Mr. Rhodes as follows:

No. 24 Woods' Planished-Iron Jacket.

340 lbs. of iron at 9.15	$31.11
Tinner's labor for putting on jacket	6.00
Total for planished-iron jacket	$37.11

No. 24 Cold-Rolled Steel Jacket.

340 lbs. steel at 3.12	$10.61
Tinner's labor for putting on jacket	6.00
2½ pints Rogers' engine black, at $2.65 per gallon	83
Labor, 2½ hours, at 20 cents per hour	50
Total for painted steel jacket	$17.94

The Pennsylvania Railroad began experiments with painted jackets at Altoona about two years ago. The painting was pretty thoroughly done, and durable results were hoped for, and it was believed that a heavy iron jacket well painted would be cheaper than the planished iron jacket, and that the average appearance of the engines would be better. Mr. Ely informs Mr. Tratman that the road has adopted as standard the use of painted iron jackets for both passenger and freight locomotives and expects to extend it gradually to all the equipment. The engines are painted the standard "Brunswick green" color used on other parts of locomotives and tenders. No figures are given of first cost and maintenance by the two methods, but it is believed that the painted jackets will be less expensive.

On the Fitchburg Railroad, according to Mr. John Medway, Superintendent of Motive Power, painted jackets have been somewhat used for three or four years. The practice was introduced first to improve the appearance of old jackets, but it is now been adopted as standard for new jackets. A jacket properly painted, with a new coat about once a year, should outlive the locomotive, while a planished-iron jacket is often ruined in less than a year. The painted jackets resist the action of drippings from the engine house roof. The standard color is black, and good results have been had with a prepared paint furnished by the Pecoria Paint Co., of Philadelphia. A planished-iron jacket costs (without labor) $36, a common iron jacket of the same size costs $10.50, to which adding cost of painting the sum is $11.90. The cost of making and applying the jacket is not included in either case.

On the Delaware, Susquehanna & Schuylkill Mr. A. J. Beltz, Master Mechanic, says that experience has been short, painted jackets have been used for two years, the engines have not required repainting, the jackets are of No. 16 steel, painted with a first coat of common black paint and a second coat of common black paint with varnish. The cost per engine of these jackets is said to be about $30 over that of planished iron.

Lehigh Valley Railroad.—Mr. S. Higgins, Superintendent of Motive Power, says that the cost of painted jackets is found to be $20 less than that of planished jackets, the saving being entirely in material. The painted jacket should last the longer, for its maintenance involves nothing but repainting about once a year which can be done for $1. After a few years' service the painted jacket will look better than the planished iron. One coat of cheap metallic paint is used first, then one or two coats of locomotive black engine finish.

Long Island Railroad.—Mr. S. F. Prince, Jr., Superintendent of Motive Power and Equipment, has had Russia or planished-iron jackets painted after they became badly rusted. He believes that boiler jackets should be made of rough iron of No. 20 or No. 24 gage filled and painted like cylinder jackets. Iron so thick would keep its shape. The jacket should have a priming coat of red led on each side, then be finished outside to any desired color. It should have two coats of finishing color and two coats of varnish. This jacket would be fairly presentable two and a half to three years after painting, and the Russia iron jacket would have about the same life as to appearance. At the end of that time the painted jacket can be repainted at little cost, while the planished jacket will be about ready for renewal.

On the Erie a few engines have been painted, but Mr. Tratman secured no information as to results.

The Grand Trunk has long used painted jackets of a reddish brown color very like that used on the Erie. The jackets are Staffordshire iron No. 18 B. W. G. The cost of cleaning and painting is $2.50 for a freight engine and $4 for a passenger engine, the difference being in the number of coats and time taken to finish. Russia iron was given up because of the difficulty of getting it thick enough not to be battered. The painted jackets are practically indestructible and the expense of maintenance depends upon one's ideas about appearance.

The Dominion Atlantic Railway of Canada uses a somewhat expensive style of painted jacket. The tourist passenger business is important, and the company pays considerable attention to appearance. The standard color is crimson lake. The jacket has a coat of paint and varnish every spring. While in service it is rubbed down with waste and warm tallow, then rubbed over again with clean waste.

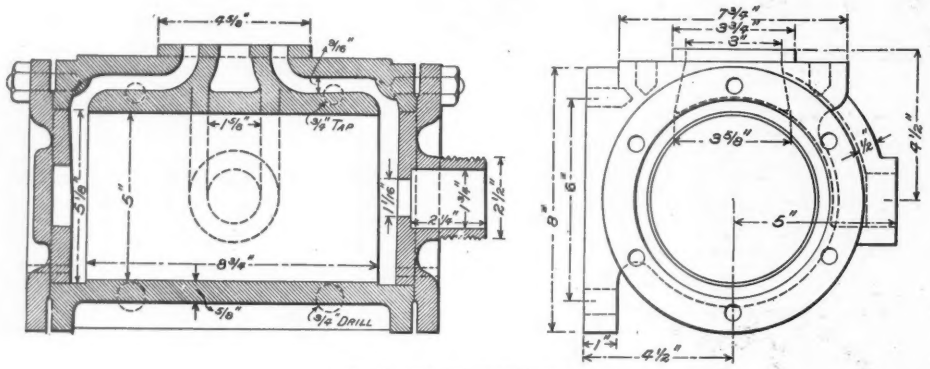


Fig. 3.—Details of Cylinders.

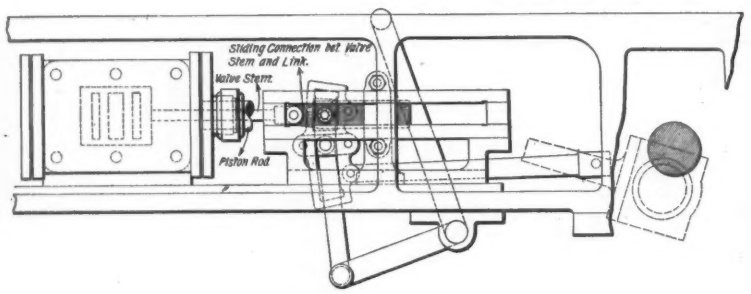


Fig. 4.—Valve Gear.

Details of Parts—M., K. & T. Inspection Car.

Some other roads have been using painted jackets experimentally. For instance, the New York Central & Hudson River and some Western roads. One Superintendant of motive power says that the cost of equipping one of his large engines with a planished-iron jacket was $78.80. Within 26 months the cost of maintenance was $11.10; total, $89.90. A similar engine with a Belgian steel jacket painted cost $62.48 for labor and material, $6.75 for painting, $30.10 for maintenance in 25 months; total, $99.33. The steel jacket was painted first with three coats of paint and two of varnish. The planished iron jacket is estimated to have a life of from eight to ten years, the painted jacket six to seven.

Of seven locomotive building companies in the United States three have never applied any painted jackets. The others says:

As to first cost the painted jacket is slightly less expensive. Smooth iron is used of about the same thickness as the planished iron or No. 22 W. G. This is painted with one coat of mineral brown filling, one coat of drop black and varnish ground together, and one coat of varnish. The cost is slightly less than planished iron.

Another company says that the painted steel jacket costs about one-half as much as the planished iron and is somewhat heavier. The planished iron used is No. 22 S. W. G. The steel is No. 20 S. W. G.

Another company says that while unable to give the figures of cost it knows that the painted steel jackets are much more expensive than those of planished iron.

Still another company says that it has been using painted steel considerably for dome and cylinder jackets, believing that it will last longer than planished iron. These painted jackets are of soft steel, No. 14 S. W. G., costing 2.1 cents per pound on the cars. They are painted with two coats of oxide of iron paint on the inside; on the outside they have a lead-color wash, then covered with a solution of white lead and Japan and varnish, then rubbed down with pumice stone and finally have a coat of black paint and two coats of varnish. This is for cylinder jackets only.

We will now give a summary of the discussion.

Mr. Benson is painting old jackets for appearance, but is putting on no new jackets other than planished iron.

Mr. Mendenhall thinks that a really better appearance can be obtained by using heavy iron jackets painted than with planished-iron jackets, the heavier jacket not being so readily dinted. It will not be so often removed, and in this respect will be cheaper. He does not remember any case in which it has been necessary to renew paint on painted jackets. The first painted jacket used by the Pennsylvania was on the London & Northwestern compound, which is now seven years old, and he believes it has not been repainted.

Mr. Minshull painted a planished-iron jacket which had been ruined by a leaky roof about two years ago. He used one coat of locomotive finish, and the engine is still running and the jacket looks about as well as when first painted. He thinks the painted jacket much preferable to the planished-iron. He uses one coat of mineral paint on the inside and one coat of locomotive finish on the outside.

Mr. Montgomery was inclined to think that it was a question of appearance. If one wanted to run rather rough-looking painted engines he could do so, but it is a question if the appearance of the engine is not worth consideration. The popularity and success of a road depends a good deal upon the attractiveness of its equipment. He questions if, giving proper consideration appearance, much would be saved by painting jackets.

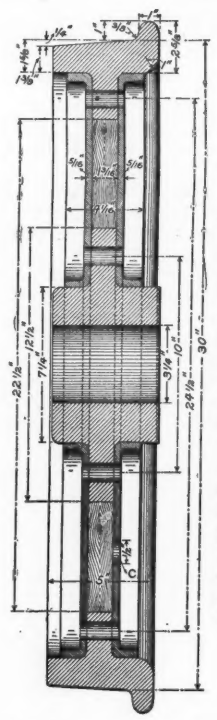


Fig. 5.—Section of Wheel.

Fenders on Street Cars in Boston.

The West End Street Railroad Co., of Boston, the cars of which are equipped with the Johnson fender, seems to be well satisfied that it now has one of the most practicable safety appliances ever devised; and it is believed that the accident list has been reduced perhaps to as low a point as is practicable, with human nature as it is. During the three years ending Oct. 14 the statistics on the West End were:

Persons in collision with fenders, 347.

Persons escaping unhurt or with slight injuries, 301, or 86.7 per cent.

Persons receiving injuries more serious, 40, or 11.5 per cent.

Persons killed, 6, or 1.7 per cent.

Electric car miles in the three years, 52,700,000.

Hence an electric car equipped with these fenders has been run on the West End an average of 8,783,333 miles before causing fatal injury to a pedestrian.

The Boston *Herald*, which publishes these figures, finds that the State Railroad Commissioners have taken no action in the matter of fenders since their last annual report. There was considerable agitation in Boston, as in other cities, regarding the matter of fenders, and the legislature ordered the Commissioners to investigate the matter, but evidently they have concluded that all reasonable demands have been met by the present arrangements of the railroads. The General Manager of the West End Company calls attention to the fact that fenders or other safety devices which come into operation only when actuated by the motorman are often worthless, for the reason that careless persons run in front of cars so abruptly as to give him no time to act; or, if he takes a second in which to operate the fender, he wastes valuable time which should be used in stopping the car. Experiments with dummy men, to test fenders of this kind, have often been made, but in every case the motorman has had ample time to see the obstruction and to prepare for it several seconds beforehand.

Solid Bridge Floors of Old Rails.

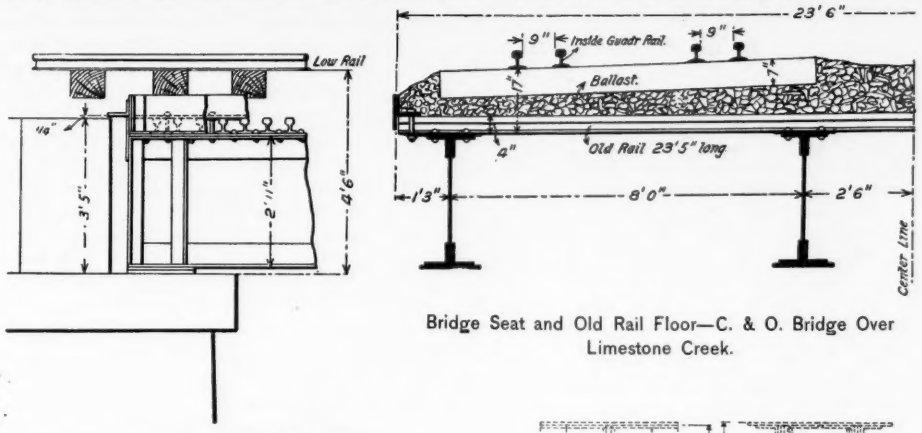
We have often taken occasion in the last three or four years to speak of the intelligent and liberal expenditures made on the Chesapeake & Ohio to improve the physical condition of the property. In bridge renewals considerable use has been made of plate girders for the shorter spans, and on these a cheap and efficient floor, close enough to hold ballast, is used. This floor is made of old rails placed transversely.

The illustration shows the flooring as applied to a double-track, deck, plate-girder bridge over Limestone Creek, on the Cincinnati division. The half plan shows how the rails are placed. As will be seen, the rivet heads in the cover plates of the girders come between the bases of the rails. The rails are used in lengths of 23 ft. 5 in. on this particular bridge, and are spaced 6 in. center to center.

It will be observed that one cover plate on each girder is extended out a short distance to hold a device for keeping the old rails in place laterally. This makes it unnecessary to rivet each rail to the structure of the bridge itself. By thus extending the cover plate the rails are held in place by ¾-in bolts spaced 1 ft. center to center, and passing through the extended cover plate below and an angle above. Between the angle and the plate the ends of the old rails are held, and they are also held by the bolts. The angle is 6 in. × 6 in. × ⅜ in. in this case, and has riveted to it a vertical plate 10 in × ⅜-in., which serves to finish up the side of the bridge and to keep the ballast from falling off. An arrangement for this same purpose is also provided at the end of the bridge, as is shown in the engravings. An angle is so riveted as to extend out over the space between the par-

apet wall and the end of the girder, in order that the ballast may not fall down between the two.

The bridge illustrated is a short one, but this type of flooring has been used on bridges up to 101 ft. Stone ballast is used over the structure, and ordinary cross-ties are placed in this ballast, just as on solid ground. The separation of the rails to allow space for the rivet heads in the cover plates provides for ample drainage. This type of flooring could not be used in those places in which the drainage cannot be allowed to drip through on to the roadway below, as for instance, in crossing streets, in which case a solid flooring with drainage to gutters and pipes leading to sewers is usually employed.

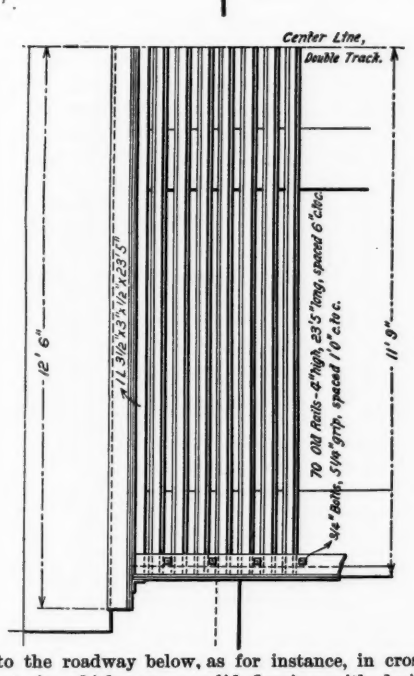


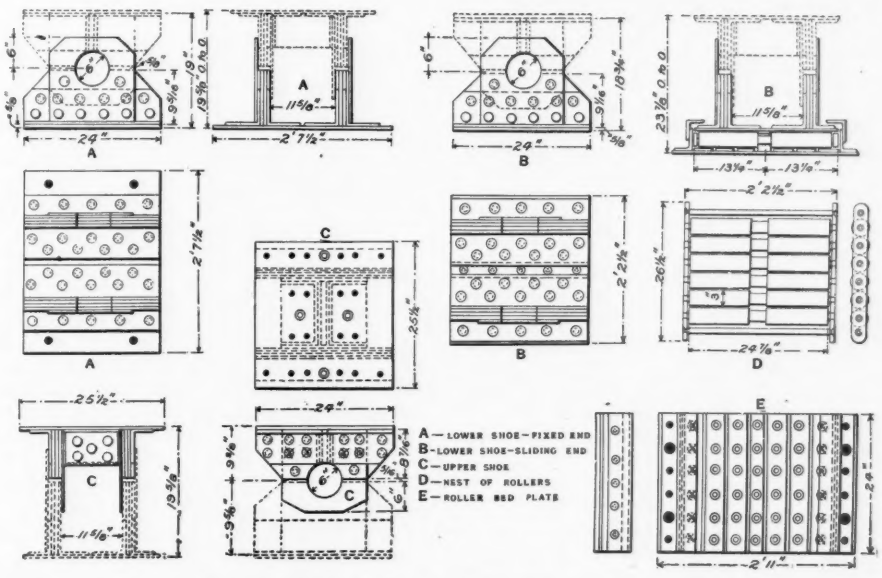
Bridge Seat and Old Rail Floor—C. & O. Bridge Over Limestone Creek.

A large plate girder bridge recently designed for the Chesapeake & Ohio is that over Four Mile Creek, on the Cincinnati Division, which is a single track, deck, plate-girder of 101 ft., out to out. This bridge is a good example of a well built plate girder. It is 99 ft. center to center of pins (the end bearings are pin bearings), and is 8 ft. 8½ in. deep, out to out. It is made of soft steel throughout, with ⅞-in. rivets. The web plates are 104 in. × ⅜ in., and are in 11 ft. 7¾-in. lengths and 9 ft. 8-in. lengths, there being four of the former and 16 of the latter for both girders. Thirty-six splice plates are used in the entire bridge, 19 in. wide, and there are two top cover plates 20 in. × 7/16 in. and 47 ft. long, and four top cover plates of the same width and thickness and 27 ft. long. The remaining cover plates are 16 in. wide and ½ in. thick. The upper and lower chords are each four cover plates deep at the center. There are 27 stiffeners along each girder with filler plates, as is the usual custom. The lateral bracing is particularly complete. For some of the details of this bridge the Pencoyd Iron Works should doubtless have credit, as it is building it.

The end bearings of this bridge are shown in Fig. 2. The pin is 6 in. in diameter. One end of each of these two girders is fixed; the other slides on a nest of six rollers as shown. The details of these bearings are so well shown in the illustrations that no particular description of them is necessary.

We are indebted to Mr. H. Frazier, Chief Engineer of the Chesapeake & Ohio for the illustrations used in preparing this article.





Details of Pin Bearing—C. & O. Bridge Over Four Mile Creek.

Joint Traffic Association Agreement.

The Presidents of the Trunk Line and Central Traffic Association roads met in New York Nov. 19, and finally approved the new agreement (outlined in the *Railroad Gazette* of Oct. 18) as revised since the meeting of Oct. 10. At this week's meeting all the important roads were represented, including the Philadelphia & Reading, but excepting the Wabash. It is officially stated that all the roads named in the agreement have agreed to it, and the assents now given are understood to practically guarantee the formal approvals by the several Boards of Directors, as each President has already received suitable instructions and authority from his Board. The Presidents at Tuesday's meeting were Messrs. Roberts, Mayer, Ingalls, Caldwell, Ledyard, Callaway, Depew, Thomas, Sloan, Wilbur and Harris.

Following is the text of the agreement:

PREAMBLE.—PURPOSES OF THIS AGREEMENT.

To aid in fulfilling the purposes of the Interstate Commerce act, to co-operate with each other and adjacent transportation associations, to establish and maintain reasonable and just rates, fares, rules, and regulations on State and Interstate traffic, to prevent unjust discrimination, and to secure the reduction and concentration of agencies and the introduction of economies in the conduct of the freight and passenger service, the Baltimore & Ohio Railroad Company, Baltimore & Ohio Southwestern Railway Company, Central Railroad Company of New Jersey, Chesapeake & Ohio Railway Company, Chicago & Erie Railroad Company, Chicago & Grand Trunk Railway Company, Cleveland, Cincinnati, Chicago & St. Louis Railway Company, Delaware, Lackawanna & Western Railroad Company, Detroit, Grand Haven & Milwaukee Railway Company, Erie Railroad Company, Grand Rapids & Indiana Railroad Company, Grand Trunk Railway Company of Canada, Lake Shore & Michigan Southern Railway Company, Lehigh Valley Railroad Company, Michigan Central Railroad Company, New York Central & Hudson River Railroad Company, New York, Chicago & St. Louis Railroad Company, New York, Ontario & Western Railway Company, Northern Central Railway Company, Pennsylvania Company, Pennsylvania Railroad Company, Philadelphia & Reading Railroad Company, Philadelphia, Wilmington & Baltimore Railroad Company, Pittsburgh & Lake Erie Railroad Company, Pittsburgh & Western Railway Company, Pittsburgh, Cincinnati, Chicago & St. Louis Railway Company, Terre Haute & Indianapolis Railroad Company (Vandalia line), Toledo, Peoria & Western Railway Company, Wabash Railroad Company, and West Shore Railroad Company do hereby constitute the Joint Traffic Association (hereinafter called The Association), and make this agreement for the purpose of carrying out the objects above named. Other companies may become members of The Association as provided in Article III.

ARTICLE 1.—BOARDS OF ADMINISTRATION.

Section 1. The affairs of The Association shall be administered by three Boards, with duties as hereinafter specified: (a) A Board of Control. (b) A Board of Managers, hereinafter called the Managers. (c) A Board of Arbitration, hereinafter called the Arbitrators.

Sec. 2. Wherever the term traffic is used herein it means both freight and passenger traffic.

ARTICLE 2.—TRAFFIC SUBJECT TO THE ASSOCIATION.

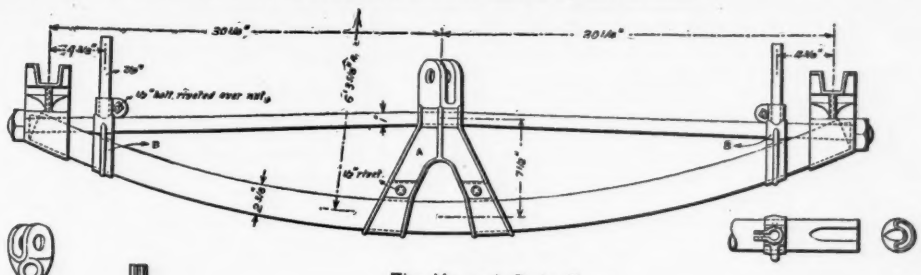
Section 1. The Association shall have jurisdiction over all competitive traffic (subject to the exceptions noted in Section 2 of this Article) which passes to, from, or through the western termini of the Trunk Lines, viz.: Toronto, Canada; Suspension Bridge, Niagara Falls, Tonawanda, Black Rock, Buffalo, East Buffalo, Buffalo Junction, Dunkirk, and Salamanca, N. Y.; Erie, Pittsburg, and Allegheny, Penn.; Bellaire, Ohio; Wheeling, Parkersburg, Charleston, and Kenova, West Va., and Ashland, Ky., and such other points as may hereafter be designated by the managers as such termini; also all traffic which may pass through other junctions of the companies parties hereto which is included when passing through any of the termini or junctions above or hereafter specified, and such other traffic as may by common consent of the parties be hereafter included herein.

Sec. 2. The following shall not be included: (a) Coal, coke, iron ore, mill cinder, limestone, and petroleum, crude or refined. (b) Traffic destined to or coming from Florida, Georgia, North and South Carolina, Virginia, and West Virginia south of the south line of the Chesapeake & Ohio Railway.

ARTICLE 3.—THE BOARD OF CONTROL.

Section 1. The Presidents of the companies forming the Association and of such other companies as may become parties hereto shall constitute the Board of Control, which shall meet on the written request of any three of its members.

Sec. 2. In case of the absence of any member of the Board of Control from a meeting, the next ranking officer in such company having jurisdiction over traffic will have authority to act in his place and stead.



The Monarch Brake Beam.

The Monarch Brake Beam.

The Monarch Brake Beam Co., Limited, Detroit, has recently been organized for the purpose of making the "Monarch" brake beam. The officers are, J. H. Berry, Chairman; George Fuller, Vice-chairman; T. H. Simpson, Secretary; W. G. Smith, Treasurer. The Chicago & Grand Trunk Railway Co., after considerable trials in regular service on engine tenders, was so well satisfied with the beam that preference was expressed for it when placing orders for new cars. The Monarch Brake Beam Co. is now filling an order for 2,000 beams for cars being built at Pullman shops.

The beam is constructed on the principle of the bow string truss, the top chord or compression member being a 2⅝ steel tube, the bottom chord or tie rod being of 1 in. iron or steel, and the other parts of malleable castings. It is simple in construction and has few parts.

The tube is buckled and slotted at each end, and as inserted in the brake head goes over the rod in such a way as to keep it from turning. This arrangement is shown in the engraving. The malleable iron strut *A*, shown in the detail view *D*, is slotted to a distance of 1½ in. back from the rings which receive the pipe, and after the pipe is inserted these slots are drawn together by rivets, thus firmly gripping pipe. The clips *BB* are split, as shown in the detail view *C*, and are brought together by a ½-in. bolt which is riveted over the nut. The end of the main tension rod is also riveted after the nut is set up.

Sec. 3. Each member of the Board of Control shall be entitled to one vote, except that no system as designated in Article IV. shall have more than three votes in the aggregate. It shall require three-fourths of the entire number of authorized votes to adopt any proposition coming before the Board of Control.

Sec. 4. The Board of Control shall fix the salaries of any Commissioners appointed by the Managers. The salaries of other officers and employees of The Association shall be subject to its review and approval. The Board of Control shall select the Arbitrators and fix their compensation and term of service.

Sec. 5. The Board of Control shall appoint an Auditing Committee who shall examine and report to it upon the accounts of the Association.

Sec. 6. The Board of Control shall prescribe the conditions and rules under which additional railway systems or companies shall become parties hereto and be represented upon the Board of Managers.

Sec. 7. Only the Board of Control shall consider appeals from the action of the Managers on all questions as to rates or fares, except differentials.

(*Continued on page 773.*)

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The latest issue of the *Chronicle* contains the customary compilation of railroad gross earnings, this time for the month of October. The results for the month are the best that have been recorded since the revival began. The statement includes 139 railroads, working 104,000 miles, and on these the gain in gross earnings over October of 1894 was 6.59 per cent. Of all these roads only 37 show decreases. There are 11 railroads included in the list which show gains in gross of over $100,000 each, and this list is headed by the Chicago, Milwaukee & St. Paul with a gain of $861,000. The Great Northern comes next with $372,000 and the New York Central is next with $349,000. The Northern Pacific has gained $314,000. The Burlington, Cedar Rapids & Northern and the Illinois Central each gained over $200,000. The Burlington figures are not yet published, but it is presumable that that system will show large gains. The list of roads which lost is headed by the Texas & Pacific with $227,000 lost. The Missouri, Kansas & Texas follows with over $175,000, and the other roads showing losses are the International & Great Northern, the Atchison, the St. Louis Southwestern and the Buffalo, Rochester & Pittsburgh. Generally speaking, the gains are attributable in a very great degree to the large movement of grain, which, at the Western primary markets for the five weeks in 1895 was 85 per cent. more than the movement in 1894; that is, it amounted to 83⅓ million bushels against 45 millions. Chicago was the greatest gainer of any single point in this large movement. The losses, which with few exceptions are in the Southwest, are attributed to a short cotton crop and its slow movement to market. Moreover, the present comparison is made with a month in which the Southwestern roads made, in many instances, the largest October earnings on record.

Last Tuesday morning, shortly before daylight, an express passenger train on the New York Central Railroad was wrecked for the purpose of robbery. Two men were killed and a number of persons were injured. The wreck was caused by unfastening the rails and turning their ends to run the train off the bank. This incident did not occur, be it observed, in Arizona or Nebraska or Texas, but in the very heart of the "Empire State" and on one of the most important and most frequented railroads of the world. The crime was not committed by tramps or old criminals, but by common village loafers, boys 18 or 19 years old, citizens of the neighborhood. It would be almost ridiculous to suppose that such a thing could happen in England or on the Continent of Europe. Why, then, should it happen in the most "civilized" section of the United States? This is a question which we leave to the social philosophers; but we take the liberty to say that a community in which it could happen is not really civilized, but is to that degree barbaric. We are inclined to think that one of the chief reasons for this familiar lawlessness toward the railroads is to a considerable extent the result of the systematic work of an irresponsible press and of other irresponsible public guides who have long and persistently taught that the railroads are public enemies

The new traffic organization of the trunk lines and their connections, which has been under consideration for several months, was finally agreed to by all of the presidents on Tuesday of this week, and we print the text of the agreement on another page. The presidents expect to appoint commissioners and arbitrators on Dec. 12, and the agreement is to go into operation on Jan. 1. The changes in arrangement and phraseology since the meeting of Oct. 10 (which was reported by us Oct. 18) are very numerous, but the only radical changes are those in Articles 7 and 18. The Pennsylvania Railroad people seemed to lose their enthusiasm after the meeting of Oct. 10, and they finally proposed amendments based on their belief that the charter of the road would not permit the directors to make the Joint Traffic Board the exclusive agent of the road, and the changes in Article 7 have been made to meet this difficulty. The Board of Managers (at first called "directors"), instead of *fixing* rates, will have power only to recommend changes. The roads, instead of appearing to abolish all their tariffs and start out with new ones, reaffirm the rates now in force; and the "Managers," instead of *ordering* changes, will simply *recommend;* but any company failing to promptly observe such recommendations shall be deemed to have violated the agreement. Thus each company retains its own rate-making power, but binds itself to observe the wishes of its competitors as represented by the Board of Managers.

The managers do not command, but "their wish is law," all the same. The Pennsylvania will comply with its charter because it will not use the managers' rates until it has expressed its will to use them. The philosophy of this clause of the agreement is somewhat like that of the man going to jail who asserted that he went voluntarily; the sheriff did not use any physical force and, of course, the prisoner's legs did not act until after his will had acted. The 30-day period is retained and each road does, to that extent, absolutely restrict itself. Article 18 provides that if the A & B road incurs a penalty and does not pay it in 15 days, the C & D, or any other road, may withdraw from the Association in 30 days thereafter. In addition to this, article 21 provides for withdrawals on 90 days' notice, so that the five-year idea has been robbed of its importance. It will be observed that a three-fourths vote is required in all transactions and that no "system" shall have more than three votes in the Board of Control. The arbitrators are not to consider questions of rates and fares (except differentials). The opinions expressed by us Oct. 18 demand little, if any, qualification. It still remains true that the strength of the agreement depends largely upon the spirit of the companies and upon the character of the men whom they appoint on the Board of Managers. The agreement does not contain important elements of strength in its wording, superior to those of previous agreements, except in the requirement that changes in rates shall be made only by Boards of Directors, and in the 30-day-notice clause.

The names of the members of the Board of Managers will probably be announced soon. Most of the presidents say that they have not yet decided whom to appoint, but we understand that in three cases the selection has been practically settled, viz.: Baltimore & Ohio, Orland Smith; Chesapeake & Ohio, O. G. Murray; Erie, G. G. Cochran.

An Electric Railroad Accident.

Last Saturday night a very serious street car accident happened in Cleveland, O. A trolley car fell through an open drawbridge on the Central Viaduct and was crushed on a bunch of piles 120 ft. below; and 15 people lost their lives. Among these was the conductor. The motorman saved his life by jumping from the car before it fell.

From the accounts that have reached us it appears hat a contrivance had been in use which interrupted the current on the opening of the drawbridge, but that this had been given up and a derailing switch substituted. But we are not certain that that the cut-off had been abandoned, for in what purports to be the motorman's story before the coroner he says that as he passed the cut-off his lights did not go out and therefore he supposed all was right. The motorman did not see the red lights on the bridge gates; the night was thick with mist and drizzling rain.

The story is that the conductor went ahead, set the switch right for the continuous track and signalled the car ahead. If that is true, it would seem that the accident was, like so many of those occurring on roads operated by steam, in part due to the failure of the human agent and in part to the failure of what ought to be adequate mechanical safeguards. It would seem that the device which had been used, by which the circuit was broken by the opening of the drawbridge, would have been perfectly safe, while it worked, as it would have been mechanically impossible for the car to proceed, except by its own momentum, or by the effect of a down grade. Further, there is no question that the derailing switch should have been so interlocked with the draw that the conductor could not turn it while the draw was open. This is a perfectly obvious and well-known precaution, in constant use on steam railroads, which from all accounts seems to have been neglected here.

Without knowing all the facts it is useless to speculate as to whether or not the drawbridge was reasonably protected; but there is one very safe conclusion to draw, which is that running railroads by electricity is just as dangerous as running them by steam locomotives, making due allowance for speed and weight, and that it must be surrounded by just as many safeguards. This appears to be a great fact not sufficiently considered by those who are responsible for equipping and operating electric roads, and each succeeding month confirms the view that they will not consider it sufficiently until they have gone through the experience of costly accidents which the steam railroads have gone through. One must watch with great apprehension the multiplication of grade crossings of electric lines with steam lines, or of electric lines with each other. An immense number of such crossings exists where, in justice to all concerned, the grades should have been separated in the beginning and where the next best thing ought to be insisted upon, proper signals and derailers. The plain lessons of more than half a century are disregarded. As it was in the early history of the steam railroad so it is in the present era of the electric railroad, cheap construction and cheap operation are realized, but at the expense of insufficient protection to life and property; and the cost of building and working electric roads must, no doubt, be increased in order to make them safer. Here again, as with steam railroads, the cost of providing and working reasonable safety appliances will, no doubt, be made up by the saving in payments for damages to life and property. We apprehend that the average cost per mile of building and equipping electric roads will be gradually raised as these facts become more and more apparent to the engineers, the financiers and the great public.

The Latest Word From the Interstate Commerce Commission.

An abstract of two decisions issued simultaneously from the Interstate Commerce Commission was published in the *Railroad Gazette* last week, page 764. They cover the same point and are of more importance than any other of the Commission's utterances in the last few months. The subject dealt with was the question of rates charged on shipments of iron, coal and grain to Cordele, a small town in Georgia, from larger distributing centers. The complaint was the ancient one of high local and low through rates on low class freight, with the alleged result of oppression of the small town and unjust discrimination in favor of its more fortunate neighbors. In the opinions the Commissioners have gone over the old ground in detail, discussing the general theory of the subject, and presenting the particular case with a great mass of testimony and figures.

The gist of the whole matter is the legality of the common "basing-point" system of adjusting rates, which is the ordinary commercial system by which through rates are adjusted to fixed competitive centers and local rates added from these places to interior points. As to this question the Commissioners have never left their opinions in doubt from the very beginning. In their last decisions they stand consistently by the platform laid down in their first decision; they repeat what was long ago said by Judge Cooley in the Louisville & Nashville cases. And there can be no doubt that the Commissioners have in this respect caught the intention of the law under which they move and have their being.

The Interstate Commerce Act struck directly at this very condition of things. Its object was avowedly to wipe out the unjust discriminations which undoubtedly existed on all sides against small interior places, and it has been strictly construed and applied. For the effects of this we have only to look at the readjustment of trade centers which has gone on in the West particularly, and in the South. The law in its application has borne heavily on the smaller interior cities which were jobbing centers, while it has brought producers at interior points into direct dealing with the large distant markets. This was accomplished with considerable shock and disturbance in the earlier years, but the railroads soon adjusted themselves to the more reasonable

demands of this sort, because in very many cases the former arrangements were patently unjust.

But the rigid application of this principle, that small interior points must be put on a level with competitive points, has proved all along, like the other strict theories of the Commission, uncommercial and unworkmanlike in practice. The iron-bound theory is that the whole basing point system is a matter of undue discrimination against the smaller places. In the words of the present opinions: "It is not a matter of the least importance, in the legal sense, that the small towns are strictly local and non-competitive." This principle is applied to the cases in hand as a deduction from the general section of the act on discrimination, and directly from the long and short haul clause, with a result that may seem specious, but is, in the present instance, uncommercial.

The proof of this is not far to seek. This small town of Cordele has grown up since the building of the Savannah, Americus & Montgomery and the Georgia Southern & Florida railroads. A review of the figures in the report and of the earnings of these roads makes it perfectly plain that the railroads have done the best they could for this town in the matter of rates. That their rates have not been in themselves oppressive is shown by the growth of the place and of its various industries. It seems difficult in theory to justify the demand of a town which practically owes its creation to the railroads to be placed on the same level with larger centers whose existence in the first place was the one fact which enabled the roads to push out to the smaller places in the interior. The condition of these two roads financially offers a rather sarcastic comment on the complaint of higher rates than the situation justifies, for the latter of the two went into receivers' hands in 1891, and the other road followed its example in 1892. It is probable, then, that the present orders of the Commission will be quite impracticable to put into effect.

But it seems equally clear that the Commission will stick to its strict theory to the end of the chapter. It will be recalled that the English Commission of 1872 and the years following swung to the opposite extreme, and held unshaken to the notion that geographical position was to be treated as a vested right. But this particular feature of the rate problem is not wholly a question of latitude and longitude, nor can it be settled by applying the rigid and iron principle of our Commission. The true position must lie between these two extremes. The complex conditions of a rate situation, like the cases under discussion, must be treated more on their own particular merits, and refuse to square themselves to the most perfect theory in the world.

Annual Reports.

Great Northern.—The report of the Great Northern Railway Company for the year ending June 30, 1895, appears this week. The results from operation show very important gains over 1894, but as 1894 was the year of the great strike of the American Railway Union, a comparison of these two years alone is necessarily misleading. Therefore, in the table which follows we give the percentages of gain or loss of the last year as compared with both 1894 and 1893:

	1895.	1894. Gain per cent.	1893. Loss per cent.
Gross earnings	$13,109,940	16	3
Oper. expenses	7,146,462	10	2.6
Net earnings	$5,963,478	23	3.7
Taxes	459,216	11	....
Net income	$5,504,262	24	5.3
Working exp. per cent	54.51	57.19	54.24
Exp. and taxes per cent	58.01	60.82	57.02

The results of working per mile of road are shown in the table below:

	1895.	1894.	1893.
Gross earnings	$3,481	$3,013	$4,035
Working expenses	1,898	1,723	2,189
Net earnings	$1,584	$1,290	$1,846
Miles worked	3,766	3,765	3,352

It will be observed that per mile of road the gross earnings were $554 less in 1895 than in 1893, the operating expenses were $291 less, and the net earnings $262 less As compared with 1893, some savings were made in the maintenance accounts. In that year the expenditure for maintenance of equipment was $1,045,418; in 1895 it was $950,937. The maintenance of road and structures in 1893 cost $2,107,414. In 1895 this item was $1,909,313. The saving in these two items was about $193,000, or, distributed over the mileage worked last year, about $51 a mile; but the saving in working expenses, as compared with 1893, was $291 a mile. The average receipts per ton per mile in 1893 were 1.232 cents; in 1895 they were 1.014 cents. We must look therefore for some other reason than savings in maintenance account and increase in rates for the source of the gain in net revenue per mile.

The fact is that this property is being worked with great skill and diligence as a net revenue earner. The fundamental idea is not to show gains in tonnage, but increase in profits. A good indication of this is seen in the average train loads. The average freight train load was 237 tons; in 1894 it was 227 tons, and in 1893 it was 235. As compared with 1894, the mileage of loaded freight cars increased 28.27 per cent.; the mileage of empty freight cars increased 21.76 per cent.; the total car mileage increased 26.61 per cent. We do not find car mileage statements for earlier years, but the figures given show elements of economy in operation which have undoubtedly had a great deal to do with the favorable results.

The rate per ton per mile for 1894 was 1.096 cents, and attention is called in the report to the fact that if the average rate in 1895 had been as high as in 1894 the gross earnings of the company from freight traffic would have been $838,182 more. The result of the lower rates was that per train-mile the earnings in 1895 were 9 cents less than in 1894; that is, $2.45 against $2.54, notwithstanding the fact that the load was 10 tons more.

The passenger earnings in 1895 did not increase as much as the freight earnings, as compared with the year before; that is, they were $1,855,000 in 1895, and $1,810,000 in 1894, and yet the passenger rate per mile was considerably higher, being last year 2 551 cents, the year before 2.361. The decrease in volume of passenger business and the increase in average rates are both natural results of the general business condition which caused a falling off in emigration to the newer territory. We are informed, however, that during the summer a considerable movement toward the fertile and low-priced lands of North Dakota and Minnesota has set in and it is believed that this will extend to the States further west and especially to the State of Washington, which offers great attraction to farmers and stock raisers.

The report states that the crop of 1895 indicates the heaviest grain tonnage ever hauled by the road, which will be handled under more favorable conditions than ever before. It is added that the fiscal year ending June 30, 1896, should show the largest net earnings in the history of the company. As a matter of fact, the company has been making considerable expenditures to promote cheap handling of its traffic. These have been not only in the direction of putting in heavier rails, filling trestles and building heavy steel bridges, but also in great additions to terminal and division yards. This last point is one of especial importance at the head of Lake Superior, where so much of the traffic of the system flows over the line of the Eastern Minnesota, which road does probably the heaviest business that is done on any single-track railroad in the United States. While the main track of this railroad is only 72.39 miles, its side tracks aggregate 43.46 miles, indicating the expenditure that must have been made to accommodate the heavy tonnage passing over it. In fact, we should suppose that before many years this line would need to be double-tracked.

The revenue account of the leased lines of the St. Paul, Minneapolis & Manitoba shows the surplus earnings transferred to the income account of the Great Northern as $131,672, after paying guaranteed interest and guaranteed dividends on the stock and bonds of the former company. The gross income of the Great Northern, which is made up of this surplus and of interest and dividends on securities owned and rentals of lines leased, amounts to $1,439,508. From this a 5 per cent. dividend was paid, aggregating $1,250,000, leaving a balance to profit and loss of $189,508.

Concerning the results of working the allied steamship companies on the Great Lakes, little information is given. We are informed that a large tonnage was carried during the year, but most of it at very low rates. The Northern Steamship Company shows for the year ending March 31, 1895, gross earnings of $549,464, and operating expenses of $665,423, giving a net loss of $115,959. All of this, it must be remembered, was the result of operation of one steamer the first season, the "North Land" not having gone into service until June of this summer. Concerning this the report says that a very satisfactory increase in the business of both steamers has been shown, particularly in the travel brought by them to the railroads. From the scanty information which has reached us, we are prepared to believe that a small net earning may be shown as the result of this season's operation of the two ships.

The annual report of the Manhattan (Elevated) Railway Co. for the year ending Sept. 30, 1895, contains considerable confirmation of what we have sometimes said with regard to the effect of the improvements of the surface lines on rapid transit in New York. That report shows that for the year in question 179,234,356 passengers were carried on the Manhattan line proper. The year before 190,669,854 were carried, and in 1893 214,459,217. The falling off in numbers since 1893 was almost 35½ millions, or over 16 per cent. The falling off as compared with 1894 was 11½ millions, or about 6 per cent. This, it must be understood, is exclusive of the suburban lines. Including them, the numbers carried in the three years are 219.6 millions in 1893, 196.2 millions in 1894, and 188.1 millions in 1891. There was a substantial increase in the suburban lines, but relatively to the great mass carried it amounted to little. It has been said and believed by some that the great shrinkage in the elevated railroad business is due more to the hard times than to competition. No doubt it is to a considerable extent due to hard times, but we should suppose that a much more important element is the competition of the improved surface lines. The best way to test this theory would be to collect and compare the total figures of passenger movement by all lines, showing what the growth has been in the aggregate and where the growth has been the greatest. This cannot be done now for 1895, but we shall hope soon to collect such figures. The loss of 35½ million passengers means a falling off of just that number of five-cent pieces in gross revenue. In fact, the gross revenue in 1895 was nearly $400,000 less than in 1894, and nearly $1,400,000 less than in 1893. The net earnings in 1895 were $3,613,000; in 1894, $4,043,000; in 1893, $4,927,000. After paying dividends there was a deficit of $392,000 as against a surplus of $1,111,000 in 1893. The percentage of operating expenses to the gross earnings has risen from 55.76 in 1893 to 62.93 in 1895. It is said that gross and net earnings are now improving; and we should be disposed to think that the worst effect of the competition of existing surface lines had already been felt. But with the further improvement of surface lines, both in length and in facilities, and with the further development of the system of transfers, there may be a still further loss of business from the Manhattan. Naturally that loss will be arrested when the full effect of the drain is felt in reducing the congestion of the Manhattan trains, and also when the short trip business is provided for. One would not suppose that a considerable longitudinal extension of the surface lines would affect the Manhattan very much, except by giving facilities to still other short-trippers; but it is just these facilities that will be provided if the plans now attributed to the Metropolitan Traction Company are carried out. These plans include an extension of service in the lower part of the city beyond anything ever contemplated in earlier projects.

It is reported that the railroads using Pullman sleeping cars are about to present a petition to the Pullman Company to have the price of upper berths reduced at least 25 per cent., though the general passenger agent, who is said to have written a private letter to the general passenger agents of all the leading roads, asking them to join in such a request to the Pullman Company, denies having taken action. The only apparent motive for making the prices of upper berths less than those for the lower ones would be to make larger average loads, but it does not seem very certain that such a result would follow. Where more than one sleeping car is required on a route, a part of the time but not regularly, it might be that enough of the early purchasers of tickets would engage upper berths to enable the agent to decide better or earlier whether he would need a second car; but on the New York and Boston line, where upper berths have long been sold for only two-thirds the price of lower berths, this has not proved to be the case. The officers of that line do not see much in the lower rate except a concession to passengers who practice close economy, and it is not clear that the public appreciates this very greatly. If a road desires to make such a concession it ought to go in on a larger scale and run two grades of cars, for one of the inducements to ride in a sleeping car is the higher social average found in it, and a reduction of rates tends to lower this average.

NEW PUBLICATIONS.

Tales of an Engineer. By Cy Warman; New York: Charles Scribner's Sons. Price, $1.25.

This is a book of 250 pages 4½ × 7 in., containing descriptions of rides on locomotives, with other stories, more or less tinged with fiction, which Mr. Warman has written during the last year or two in *McClure's Magazine*, the *Engineering Magazine* and the *Youth's Companion*. The last 30 pages contain "rhymes," most of which first appeared in the New York *Sun*. These are dedicated to the general passenger agents, in grateful appreciation of the passes which the author has received from that department, and the book as a whole is dedicated to locomotive engineers, "the silent heroes who stand alone and bore holes in the night at the rate of a mile a minute." The first sketch in the book is the account of a ride from New York to Chicago on the engines of the Exposition Flyer, in 1893, which railroad men will remember to have read in the papers at the time. The later sketches were made on a trip to Constantinople and Palestine, which Mr. Warman seems to have made in 1894. The author has ideas, and now and then some humor, but his literary style is not the most polished in the world. It looks like a combination of the New York and the Chicago daily newspaper style, whipped into a temporary smartness by being dressed in large type and double leads. American trainmen can find in the book some entertaining reading concerning the things which one of their own craft sees on the surface while in Europe, as well as some sketches of engine-running in the Rocky Mountains, where the author was a runner for several years.

Joint Traffic Association Agreement.

Continued from page 771.

Sec. 8. Pending decisions by the Board of Control, the decisions and orders of the Managers shall prevail.

ARTICLE 4.—THE BOARD OF MANAGERS.

Section 1. The Board of Managers shall consist of not less than nine members, of which each of the following nine systems shall designate one. [Here follows a list of the systems, B.& O.; C. & O.; Erie; G. T.; Lack.; L. V.; Penn.; Vanderbilt, and Wabash, with the roads in each; the C., C., C. & St. L. is included in C. & O.; the Vandalia in the Pennsylvania, and the Pittsburgh & Lake Erie in the Vanderbilt; the Wabash is included only east of the Mississippi River.]

Sec. 2. Additional Managers, representing other systems or companies which are now or may hereafter become parties to this Agreement, may be designated by such systems or companies under the authority and rules of the Board of Control.

Sec. 3. Each Manager shall hold office during the continuance of this Agreement, subject to the pleasure of, and shall be compensated by, the system appointing him.

ARTICLE 5.—RELATING TO THE DUTIES AND POWERS OF THE MANAGERS.

Section 1. The Managers shall have their principal office in New York City and shall continue in session subject to their rules. They shall elect a chairman annually.

Sec. 2. The Managers shall adopt their rules and perfect their organization. It shall, however, require the affirmative votes of three-fourths of their entire number to adopt any proposition coming before them.

Sec. 3. In considering questions which exceptionally affect the interests of any company party hereto unrepresented upon the Board of Managers, such company shall be advised thereof and be afforded an opportunity under the rules of the Managers for presenting to them its views before final action is taken.

Sec. 4. The Managers shall construe this Agreement and all resolutions adopted thereunder.

Sec. 5. All applications for differentials and for changes in rates, fares, charges and rules shall be made to the Managers. Their action upon differentials and upon all questions except as to rates and fares, shall be subject to appeal, but only to the Arbitrators. Their action as to rates and fares (except differentials) shall be subject to appeal only to the Board of Control. Decisions and orders of the Managers shall be complied with until such appeals are decided.

ARTICLE 6.—APPOINTMENT OF COMMISSIONERS.

The managers may appoint not more than three Commissioners, and shall define their powers and duties.

ARTICLE 7.—RATES, FARES, CHARGES AND RULES, THEIR OBSERVANCE AND RELATION TO INTERSTATE ACT.

Section 1. The duly published schedules of rates, fares and charges and the rules applicable thereto now in force and authorized by the companies parties hereto upon the traffic covered by this Agreement (and filed with the Interstate Commerce Commission as to such of said traffic as is Interstate) are hereby reaffirmed by the companies composing the Association, and the companies party hereto shall within ten days after this Agreement becomes effective, file with the Managers copies of all such schedules of rates, fares and charges, and the rules applicable thereto.

Sec. 2. The Managers shall from time to time recommend such changes in said rates, fares, charges, and rules as may be reasonable and just, and necessary for governing the traffic covered by this Agreement and for protecting the interests of the parties hereto therein, and the failure to observe such recommendations by any party hereto as and when made shall be deemed a violation of this Agreement. No company party hereto shall, through any of its officers or agents, deviate from or change the rates, fares, charges, or rules herein reaffirmed or so recommended by the Managers, except by a resolution of its Board. The action of such Board shall not affect the rates, fares, charges or rules disapproved except to the extent of its interest therein over its own road. A copy of the resolution of the Board of any company party hereto authorizing any such change shall be immediately forwarded by the company making the same to the Managers, and such change shall not become effective until thirty days after the date of the receipt of such resolution by the Managers. The Managers, upon receiving such notice, shall act promptly upon the same for the protection of the parties hereto.

Sec. 3. The powers conferred upon the Managers shall be so construed and exercised as not to permit violation of the Inter-State Commerce Act or any other law applicable to the premises or any provision of the charters or the law applicable to any of the companies parties hereto, and the Managers shall co-operate with the Inter-State Commerce Commission to secure stability and uniformity in the rates, fares, charges and rules established hereunder.

ARTICLE 8.—PROPORTIONS OF COMPETITIVE TRAFFIC.

The Managers are charged with the duty of securing to each company party hereto equitable proportions of the competitive traffic covered by this Agreement, so far as can be legally done.

ARTICLE 9.—RELATIONS TO NON-CONCURRING COMPANIES. DIVISIONS OF RATES AND FARES.

Section 1. The Managers shall decide and enforce the course which shall be pursued with connecting companies not parties to this Agreement which fail or decline to observe the rates, fares, charges and rules established under this Agreement. The interests of companies parties hereto injuriously affected by such action of the Managers shall, in such instances, be accorded reasonable protection in so far as the Managers can legally do so.

Sec. 2. When, in their judgment, necessary to the purposes of this Agreement, the Managers may determine the divisions of rates and fares between connecting companies parties hereto, and between them and connections not parties hereto, keeping in view uniformity and the equities involved.

ARTICLE 10.—LIMITATION OF POWERS OF FREIGHT LINES.

It is recognized and agreed that economy in the operation of through co-operative and commission freight lines, and the limitation or termination of many of their existing powers and functions, are absolutely required, and the companies parties hereto will actively co-operate with the Managers, and so manage such lines as to accomplish such results.

ARTICLE 11.—MANAGERS MAY ORGANIZE JOINT AGENCIES.

The Managers shall have authority to organize such joint freight and passenger agencies as they may deem desirable, provided that if such joint agencies are established they shall be so arranged as will give proper representation to each company party hereto.

ARTICLE 12.—MANAGERS TO APPROVE CONTRACTING AGENCIES.

No soliciting or contracting passenger or freight agency shall be maintained directly or indirectly by any of the companies parties hereto, or by any freight line in connection with the traffic covered by this Agreement, except with the approval of the Managers, and no person who is decided by the Managers to be objectionable shall be employed or continued in such agency.

ARTICLE 13.—MANAGERS SHALL DEFINE DUTIES OF CONTRACTING AGENCIES.

Section 1.—The Managers shall define the authority and duties of all persons acting as contracting and soliciting freight and passenger agents in relation to the traffic covered hereby, and, with due regard to the relative interests involved, they may determine the number of such persons to be employed. The parties hereto shall observe and enforce the orders of the managers from time to time issued in that behalf.

Sec. 2. Such contracting and soliciting agents as the Managers appoint shall be carried upon the payrolls of the Association.

Sec. 3. The Grand Trunk Company may appoint soliciting agents to be located at such points in Canada as may be necessary to meet the competition of Canadian lines, not parties hereto, but such persons shall in all respects be subject to the rules of the Managers.

ARTICLE 14.—COMPLAINTS AND INVESTIGATIONS THEREOF.

When in the judgment of the Managers their information or any complaint so warrants, the officials and employees of the companies parties hereto may be examined, and in such investigation any or all officials or employees may be notified to attend, and any or all matters affecting directly or indirectly the traffic herein covered may be considered.

ARTICLE 15.—REPORTS AND DATA TO BE FURNISHED.

The companies parties hereto agree to furnish to the Managers all reports, papers, and information relating to the traffic covered hereby, which may be requested by them.

ARTICLE 16.—FORFEITURES FOR VIOLATIONS OF AGREEMENT.

For any action by any party hereto which, in the judgment of the Managers, constitutes a violation of this Agreement, the offending Company shall forfeit to the Association a sum to be determined by the Managers, not exceeding five thousand dollars, but where the gross receipts of the transaction in which this Agreement is violated shall exceed five thousand dollars, the offending party shall at the discretion of the Managers forfeit a sum not exceeding such gross receipts. Such forfeitures shall be applied to the payment of the expenses of The Association, except that the offending company shall not participate in such application of its own forfeiture.

ARTICLE 17.—DEPOSITS, EXPENSE FUND, AND PROVISION FOR FORFEITURES.

Section 1. Upon the call of the Managers after this Agreement becomes effective, each company party hereto shall deposit with them the sum of five thousand dollars, and in addition thereto, upon their like call, such further sums monthly, based upon the gross earnings of each company party hereto from the traffic covered hereby, as the Managers may decide to be necessary.

Sec. 2.—Any forfeiture made by any company party hereto, under the rules, shall be taken from the sums contributed by such company, and charged in whole to its account. If its deposit at the time, exclusive of its said original contribution of five thousand dollars, shall be insufficient, it shall pay to the Managers such deficiency within fifteen days after the forfeiture is finally adjudged.

Sec. 3.—The balance of said deposits remaining at the expiration of this Agreement shall be divided between the companies then parties hereto in the ratio in which they have contributed, less the amounts forfeited.

ARTICLE 18.—RETIREMENT FROM THE AGREEMENT.

Any party retiring from this Agreement before the final completion of the time herein fixed, except by unanimous consent of the parties hereto, shall not be entitled to any refund from the residue of deposits remaining at the close of this Agreement, but if any company fails to observe and be governed by this Agreement, which fact shall be determined by the arbitrators, and then fails to pay its forfeitures within 15 days after such decision of the arbitrators, then any other company may withdraw from this agreement upon giving 30 days' written notice to the Managers, and such company so withdrawing shall be entitled to the residue of the funds it has contributed.

ARTICLE 19.—BOARD OF ARBITRATION.

Section 1. There shall be a permanent Board of Arbitration consisting of three disinterested persons, to which appeals shall be made as to all questions, including differentials, arising under this agreement, except the determination of rates and fares.

Sec. 2. All differences between the parties hereto as to any lawful measure necessary to carry out the objects of The Association, except as to rates and fares, shall be submitted to and be finally decided by the Arbitrators.

Sec. 3. Pending decisions of the Arbitrators, the decisions and orders of the Board of Control and Managers shall prevail.

Sec. 4. Hearings shall be had upon all questions arbitrated, under the rules established by the Arbitrators, and approved by the Board of Control, and the decision of the Arbitrators or of any two of them shall be final.

ARTICLE 20.—AMENDMENTS.

Amendments to this agreement shall only be made by the unanimous vote of the parties hereto.

ARTICLE 21.—WHEN AGREEMENT BECOMES EFFCTIVE AND ITS DURATION.

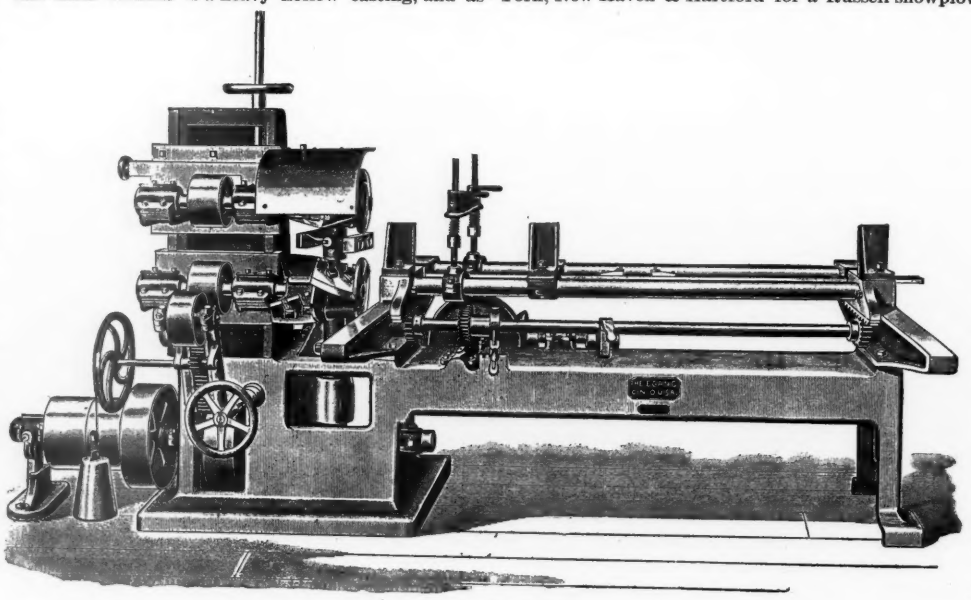
Section 1. This agreement shall not be effective until it shall have been approved by the Boards of Directors of the several companies parties hereto. Certified copies of resolutions giving such approval shall be filed with the Managers.

Sec. 2. This agreement shall take effect Jan. 1, 1896, and continue in existence for five years thereafter, subject to 90 days' written notice by any company of its desire to retire therefrom.

A Heavy Car Tenoner.

The machine shown is the most recent addition to the long line of car shop tools made by the Egan Co., Cincinnati. It is designed for cutting single and double tenons on large timbers, and is especially adapted for the use of car and bridge builders; or wherever large single or double tenons are required.

The main column is a heavy hollow casting, and as the extension supporting the bed is bolted to it on planed surfaces, the machine has ample floor space to insure steady running, and is heavy enough throughout to avoid vibration.



A Heavy Car-Tenoner.

The table, traveling on planed ways, is moved by a rack and pinion at each end, thus causing it to move parallel, and relieving the ways on which it slides of undue friction. The friction cones driving the pinions are of large diameter, and so arranged that the table returns at about twice the speed at which it goes forward to the cut. The movement of the table is controlled by a lever, and the pressure applied governs its travel according to the width of tenon to be cut.

The center support is adjustable for long or short stock; gage rods being furnished to regulate the length of the tenon, and suitable devices for holding the stock in position while being cut.

The steel mandrels, of large diameter, run in long, self-oiling boxes, with the pulleys placed between them, and have a belt tightener provided for giving the cutter heads ample power when making a heavy cut.

Timbers up to 14 inches square can be worked on the machine, which when fitted with double heads, will cut tenons up to 12 inches long, or with single heads up to 6 inches, and when fitted with the upright spindle double tenons up to 4 inches.

Suitable locking devices are arranged for keeping the slides which carry the mandrels from working out of line, and a separate slide, with an extra plate, is provided for adjusting the upper mandrel laterally.

The upright mandrel, for cutting double tenons, runs in self-oiling boxes of ample size and length, and is so constructed that the head can be taken off when it is desired to cut single tenons. The machines are made with or without this upright mandrel.

TECHNICAL.

Manufacturing and Business.

The Royersford (Pa.) Machine Co. is enlarging its plant by erecting a foundry for making heavy machine castings. It will be 42 ft. × 65 ft., and of brick.

The Ingersoll-Seargeant Rock Drill Co., which built large new works at Easton, Pa., a few years ago, now finds the capacity ot those works overtaxed, and an important enlargement is being made. The new building will be 300 ft. long, and will be an extension of the main building, which will then be 700 ft. long.

The Kalamazoo Railroad Velocipede & Car Co. made some interesting shipments of light cars for export this week. The shipments included a No. 6 inspection velocipede car to Russia; six new railroad "safties" and 25 No. 1 steel velocipedes to Australia, and six No. 1892 steel velocipedes for 5-ft. 6-in. gage track to the Argentine Republic.

Bryan & McKibbin, general agents for the Cooke Locomotive & Machine Co., Buckeye Malleable Iron & Coupler Co. A. Leschen Sons Wire Rope Co., and the Sligo Rolling Mills, have lately been appointed general agents for the Buffalo Scale Co. and for Roberts, Throp & Co. Their offices are in the Equitable Building, 120 Broadway, New York City

The Detroit Car Axle Lubricator Co., of Detroit, has been organized with a capital stock of $60,000; and Arthur W. Wright, Luther S. Trowbridge, W. M. Woolet, and others as incorporators.

The Stillwell-Bierce & Smith-Vaile Company has declared a quarterly dividend of 2 per cent. on its preferred stock, payable Dec. 1.

The Kelly & Jones Company, of Greensburg, Pa., has received an order from Angard Bay, South Africa, for an extensive consignment of brass and iron goods. This order was secured in competition with English manufacturers.

The Ensign Mfg. Co. has a second order from the New York, New Haven & Hartford for a Russell snowplow.

New Stations and Shops.

The new railroad shops to be built at Alexandria, Va., by the Southern Railway, though to be used for repair work only, will be on a much larger scale than was at first contemplated and announced. The plans were drawn last week and this week the details will be ready for estimates. There will be seven new buildings, viz., a round house to accommodate 25 locomotives, a 100 ft. × 160 ft. repair shop, a 90 ft. × 60 ft. car shop, a 90 ft. × 160 ft. wood-working shop, a 90 ft. × 160 ft. boiler shop, a store house 40 ft. × 240 ft., and a machine shop 90 ft. × 160 ft. These buildings will all have steel frames and will be covered with galvanized iron. It is the intention to begin work on them at once and complete them as early as possible.

The City Council of Mankato, Minn., have adopted the ordinance granting the Chicago, St. Paul, Minneapolis & Omaha right of way over certain of the streets and public lands of the city for its new entrance into Mankato. This new line is to be built in connection with important improvements at Mankato, including the construction of the new Union station for that road and

the Chicago & Northwestern, the entire cost of the proposed improvements being placed at $362,000.

The citizens of Dublin, Tex., have offered to give the Texas Central land for shops of the company at that city, and also $25,000 toward the cost of erecting the buildings.

The new roundhouse and machine shops of the Atchison, Topeka & Santa Fe at Arkansas City, Kan., are now completed. They take the place of shops destroyed by fire last July, but the buildings have been rebuilt on a much larger scale. The new roundhouse has 13 stalls and the new machine shop is 60 ft. × 120 ft., and is supplied with modern machinery.

The Western Maryland is to build a new station on North George street, in York, Pa. The building will be 35 ft. × 100 ft., with a train shed 200 ft. in length. It will be constructed of brick and iron, with terra cotta and granite trimming.

The Pennsylvania Steel Company is erecting a heavy steel framed pier shed and warehouse at Pier 4, Boston, Mass., for the New England road, some description of which appeared in these columns on May 17 last.

The Louisville, Evansville & St. Louis is to build new shops at Princeton, Ind., and the contracts for the buildings have already been given out. Work is to begin at once on the main building, which will be 80 ft. × 300 ft. These will be the main shops of the company and will be equipped with modern machinery. It is intended to build freight cars at the shops as well as undertaking general repair work.

Iron and Steel.

Press reports say that one of the largest contracts for structural steel awarded in the Southwest this season has just been secured by the Carnegie Steel Company. The order calls for 500 tons of beams and angles for the big tobacco manufacturers' plant to be built in St. Louis by Liggett & Myers.

It is an item of some importance that the Maryland Steel Company has started up one of its furnaces. It is nearly two years since this, one of the newest and largest of the steel plants in the country—perhaps the most completely equipped of all the steel plants in the country—shut down. It has resumed operations with a very small force, but Baltimore dispatches predict that in a few weeks all parts of it will be in operation. The depression in trade and the fall in the price of Lake Superior ore were too much for this concern, then very recently completed, which was designed to run on foreign ores. A great revival in the demand for iron and steel and a substantial advance in the price of ore have occasioned contracts for a considerable quantity of steel to be made from imported ore and to be delivered next year. Of this the Maryland Steel Company gets a good share. It is an offshoot of the Pennsylvania Steel Company, which, it is semi-officially stated, is crowded with large orders and will transfer some heavy contracts for steel rails to the establishment at Sparrow's Point, near Baltimore, where everything from pig iron to an ocean steamship, equipped and ready to go into commission, can be produced. That this new plant is starting up when prices have receded somewhat, and the evidences of a boom in the iron and steel business are less pronounced than they were a few months ago, is the more significant of continued activity in the great industry.—*New York Journal of Commerce.*

Brooklyn Bridge.

The Trustees of the New York & Brooklyn Bridge met Nov 18, to decide whether the Brooklyn Heights electric road should be allowed the use of the plaza at the Brooklyn end of the bridge, for its tracks. The question was postponed for two weeks.

The contract for lighting the New York terminal was awarded to Laight & Williams for $10,249. The Executive Committee recommended that the offers made by the Westinghouse and the General Electric companies, each to equip a train for a 30-day test of electrical service for the bridge cars, be accepted.

Hall Signals on the Lehigh Valley.

The Lehigh Valley Railroad, which has had Hall automatic electric block signals in use on several miles of its road for a number of years, has given an order for the immediate equipment of the line from Easton to Mauch Chunk, 46 miles, with these signals. The line, double track, is an important section of the main line. There will be about 200 signals in all, each block section being provided with both a home and a distant signal.

The Iron and Steel Market.

The demand for pig iron is considerably below the present supply, which is being increased at the rate of about 950,000 tons a month. The demand is probably lower than it would be were consumers not waiting for still lower prices. It seems probable that unless increased consumption compels more active buying over-production will result in a still further decline. At present the amount in stock, however, is about 400,000, or 150,000 tons less than on July 1.

According to the *Iron Age* the rails shipped during the year, to Nov. 1, aggregate about 925,000 tons. The total yearly output, which includes all kinds of steel and iron rails, was, for 1894, 1,021,772; for 1893, 1,136,458, and for 1892, 1,551,844 tons. It seems hardly likely that the 1895 production will reach the lowest of these figures.

Road Carriage Competition.

We have before now mentioned the fact that *The Engineer* (Norfolk Street, W. C., London) has offered prizes aggregating 1,000 guineas for mechanically propelled vehicles to be run on common roads. The last issue received of that journal gives some particulars not hitherto published. The judges are to be Sir Frederick Bramwell, Mr. J. A. F. Aspinall, Chief Mechanical Engineer of the Lancashire & Yorkshire Railway, and Dr. John Hopkinson. The vehicles will be divided into four classes, each of which is to receive a prize. The first class is vehicles to carry four or more persons to weigh not more than two tons loaded. The second class is vehicles to carry one, two or three persons, the weight not to exceed more than one ton loaded. The third class is for vehicles to carry one ton of goods or parcels, the weight, loaded, not to exceed two tons. The fourth class is to carry 5 cwt. or less of goods or parcels, and to weigh not to exceed one ton. The judges have power to divide any prize in case of vehicles proving of equal merit.

Any method of propulsion other than muscular power may be employed, provided that it is contained in the vehicle. No oil or other liquid used in the engine shall have a lower specific gravity than 0.8 or a lower flashing point than 73 degrees Fahr.

The trials will consist of a run of not less than 100 miles out and 100 miles back, and other runs may be demanded if necessary. Any higher speed than 10 miles an hour will not count to the credit of the vehicle making it. Any maker, seller or inventor of a mechanically propelled vehicle may enter the competition, but no vehicle shall be entered by more than one individual. Partnerships or corporations making or selling, or joint inventors, will be regarded, for the purpose of this competition, as an individual. The limit of weight, two tons, is that fixed in the bill brought before the last Parliament. The competition can hardly take place before October, 1896.

Deep Waterways Commission.

We gave Nov. 8, p. 744, the names of the commissioners appointed by President Cleveland to report on deep waterways from the lakes to the sea. The Canadian Government has appointed T. C. Keefer, Past President Am. Soc. C. E.; Thomas Munroe and O. A. Howland of Toronto to co-operate with the United States commissioners.

New Steamers for the Hamburg-American Line.

The Hamburg-American Line, we are informed, has contracted for six new steamers for their service between Hamburg and Boston, Philadelphia and Baltimore. These steamers are each of about 7,000 tons capacity. All six of these vessels will be constructed in England. Three of them will be built by the Palmer Shipbuilding & Iron Co., on the Tyne. The contractors for the remaining vessels we do not at present know.

Another vessel now being built for this company is the 20,000-ton steamer Pennsylvania. This vessel will be 560 ft. long, 62 ft. wide and 42 ft. deep. She is being constructed by Harland & Wolff, of Belfast. When this vessel takes her place on the New York route the Dania will be withdrawn. This will give the New York service six vessels, allowing one to sail each week. The Pennsylvania will accommodate about 200 cabin and 1,500 steerage passengers.

It is said that when the six new vessels contracted for go into service some of the older boats now engaged in the Baltimore and Philadelphia service will be withdrawn and disposed of.

THE SCRAP HEAP.

Notes.

It is announced in the newspapers that the Grand Trunk Railway has adopted the block system to be put into use throughout the entire line.

The Superintendent of the United States Mail Service has arranged for postal cars on fast trains between Buffalo and Detroit, through Canada, by the Michigan Central.

The Lehigh Valley, which has had to transport water in tank cars long distances this summer, has let the contract for the construction of a large additional reservoir at Delano, Pa.

The General Manager of the Kings County Elevated Railroad, Brooklyn, N. Y., says that on Jan. 1 the company will restore the 10 per cent. which was taken off the employees' wages two years ago.

Texas papers report that 15 station agents and a number of conductors have been discharged by the St. Louis & San Francisco for defrauding the road in the transportation of freight and the collection of bills.

W. H. Clune and others, strikers who were convicted of conspiracy in California in 1894, appealed their case to the Supreme Court of the United States, but that tribunal has confirmed the sentence of Judge Ross, which was imprisonment for 18 months.

At Van Cortlandt Park, a station on the New York Central in New York City, last week, a fire in a car shed destroyed several freight cars and a new car with an electric motor, on which experiments, conducted with great secrecy, have been going on for several months.

The Union Pacific has notified its employees that after Jan. 12 they will have to pay tariff freight rates on coal for their personal use. The reporters seem to assume that the company intends to wholly withdraw the long-existing privilege of reduced rates; but it looks to us more like a move to hurry up shipments, so as to get them out of the way early in the season.

Near Morrisville, Pa., on the night of Nov. 15, the Adams Express train of the Pennsylvania road was stopped by a robber, who had hidden in one of the cars, and the papers reported a "hold-up;' but the story has been boiled down to rather tame proportions. It appears that a tramp had hidden in one of the cars and that he stole chiefly oysters and cigars.

The New York & Sea Beach Railroad Company, on whose tracks occurred the serious collision of Sept. 2, killing or injuring 60 passengers, has been notified of lawsuits for damages aggregating nearly $1,100,000. The company has a capital of only $500,000, and has gross earnings of only $85,000 a year, and it has not yet settled any of the claims growing out of this collision.

The New York Dock Board has set apart the piers at West Fifty-second street and West Fifty-fourth street, North River, and the space between them for the sole use of canal boats, this regulation to go into effect next spring. Hitherto canal boats have landed mostly on the east side of the city in the vicinity of Coenties slip, and the new station is provided to avoid the inconvenience to passenger and other boats caused by the towing of large numbers of canal boats around the Battery.

At Altoona, Pa., recently, Henry Cresswell, a yard conductor, boarded a runaway engine, which was moving at about 25 miles an hour, and stopped it in season to prevent a wreck, although he was dragged violently for a considerable distance before he was able to pull himself into the cab. General Superintendent Sheppard sent him a complimentary letter with a check for $50. The engine had escaped several miles up the hill while the engineman and fireman were off looking at a wreck.

According to a St. Louis paper the railroads centering in that city have agreed to prohibit the sale of intoxicating liquors on local excursion trains. It appears that on some of the roads summer excursions have been run, of late years, in which the baggage car was the most interesting part of the train to some of the passengers, a bar set up by the picnickers dispensing liquors of all sorts. As might naturally be expected, the conductor often found the outward trip nearly as exciting as the homeward trip is on ordinary picnic excursions.

The State Railroad Commissioners of New York have denied the application of the Long Island Railroad Co., for a certificate that the public convenience and necessity require the construction of the company's proposed road in the Adirondack region. The Commissioners, in deciding that there is no proof of the necessity of the road, state that "the fact that a prior application which has been granted has not been followed by construction leaves the Board in doubt as to whether the actual character of the successive applications has been disclosed. The suppression of all mention or suggestion of the second application until after the first was granted does not commend itself as a method of approaching this Board or any medium through which the State grants privileges or powers."

Union Elevated Loop, Chicago.

On Thursday, Nov. 24, a decision was given by the Appellate Court in Chicago, concerning the injunction obtained by several property owners along Wabash avenue, restraining the Union Elevated Loop Company from erecting their superstructure in front of the buildings owned by these persons. Mention of these suits was made in the *Railroad Gazette* of Nov. 8. The decision was that the Circuit Court was ordered to dissolve the injunction, and the property owners were notified that their only remedy is by a suit at law. The sole point decided was concerning the right of abutting property owners to enjoin the erection of an elevated railroad in a street, and the decision of the Appellate Court was that the property owner has no such right; no one having a right to enjoin such work but the public through the medium of the Attorney-General. If abutting property is injured, the only redress is by a suit at law for damages. The question whether the ordinance was invalidated by the purchase of consents did not come up in considering the dissolution of the temporary injunction.

As soon as the injunction was dissolved the Union Elevated Loop Company began putting in foundations and it is very unlikely that they will be prevented from completing the work. The southern portion of the loop, from Wabash avenue to Fifth avenue, has not yet been decided on. The Elevated Company wishes to build on Van Buren street, but a strong opposition has been developed among the property owners on this street. As this has been the case, however, on Wabash avenue where the Elevated Company has now successfully obtained right of way, it is most likely that they will obtain an ordinance to build on Van Buren street if they wish.

Lake Notes.

Lake freights from the head of Lake Superior are still $2 on ore to Lake Erie and six cents on wheat, so that all the tonnage is in the wheat trade. From Escanaba ore rates are lower, being $1 10 to Lake Erie, so that some charters are being made. The last shipments of ore will be made from Ashland Nov 25, with a total for the season of about 2,400,000 tons, and from Two Harbors the season will end Dec. 1, with 2,100,000 tons. Duluth shipments are restricted to one mine, which will be active till December, and the total shipments of the port are about 2,000,000 tons. It is notable, as showing the carelessness with which Custom House statistics are made up, and the utter uselessness of government figures, that these two ports show by the Custom Houses less than 3,100,000 tons shipments.

All lake dry docks from Buffalo to Duluth will be busier the coming season than for years. So high have been freights of late that the most rapid and temporary repairs have been made in cases of damage, and the low water has occasioned so many groundings that a great number of steamers will have to be overhauled.

The Union Pacific Telegraph Suit.

The long-pending case of the United States against the Union Pacific Railway and the Western Union Telegraph was settled at Washington, Nov. 18, by the unanimous decision of the Supreme Court, announced by Mr. Justice Harlan. The decision declares that Congress has the right to add to, amend or alter the acts of 1862-64 granting aid in bonds and land to the railroad company. By this decision the Supreme Court reverses the decree of the Court of Appeals and affirms that of Judge Brewer. Justice Brewer took no part in the consideration of the case before the Supreme Court. In his opinion Mr. Justice Harlan said, in rerefence to the object and scope of the Pacific Railroad acts, that the first 18 sections of the acts of 1862-64 are wholly inconsistent "with the idea that the Union Pacific Railroad Company could have fulfilled its obligations to the Government by simply constructing a railroad, without making any provision whatever for the construction or operation of a tele-

graph line, thereby leaving all communication by telegraph along its route to the absolute control of private corporations deriving no authority from the national government, and whose operations would not ordinarily be subjected to national supervision. The opinion further holds that since the passage of the act of 1866 no telegraph company can, by contract with a railroad company, operating one of the post roads of the United States over which interstate commerce is conducted, acquire an exclusive right to such railroads for telegraph purposes, and the contracts between the Union Pacific and the Western Union, by which the latter was given the sole right to maintain its telegraph lines on the right of way of the road, are null and void. Any telegraph company which accepted the terms of the Act of 1866 has the right to place its poles on any postal route of the United States provided it does not interfere with the railroad company in the operation of its road. The Union Pacific Company, under the terms of the decision, must undertake the management of its own telegraph line along the route of its railroad.

In the other suit the case of the United States against the Union Pacific and Western Union, the decision was against the Government. In this case, in 1888, the Government sued to recover $12,495 paid for the transmission of telegrams over the Union Pacific wires operated by the Western Union, which, by the act of 1878, should have been retained by the Government and applied in part to the interest account of the railroad company with the United States and in part to the sinking fund. The court below found for the defendant companies on the ground that there was no way to determine whether or not the messages were sent over the wires owned by the railroad company or over those of the telegraph company, and that the Government had never asked or required that the accounts be kept so as to show this. This judgment the Supreme Court affirmed.

LOCOMOTIVE BUILDING.

The Pittsburgh, Fort Wayne & Chicago completed a new heavy class "R" freight engine at the Fort Wayne shops last week, this engine being the seventh of that class built at the Fort Wayne shops within a year.

The Ohio River road has placed an order with the Brooks Locomotive Works, of Dunkirk, N. Y., for two freight locomotives to be delivered as soon as possible. Although the Ohio River road has largely increased its equipment during the past year, it is still far behind in capacity to handle the freight offered. This is partly due to the low water in the Ohio River, which has been closed to navigation 10 months of the past year, throwing much business to the railroad, and to the rapid development of the oil fields along the line.

CAR BUILDING.

The Ensign Mfg. Co. has an order from the Chesapeake & Ohio, for 100 plain bottom gondola coal cars, 34 ft. in length, of 30 tons capacity.

The South Baltimore Car Works, at Curtis Bay, are building 50 coal cars for the firm of Black, Sheridan & Wilson, to be used on the Baltimore & Ohio.

Receiver R. B. F. Pierce, of the Toledo, St. Louis & Kansas City road, has applied to the courts for authority to purchase 500 new coal cars which are needed to handle the growing coal business of the company.

The South Baltimore Car Works has just completed an order for 50 hopper coal cars for the Merchants' Coal Co., of Baltimore. These cars will be used in service along with the Baltimore & Ohio. They are equipped with air brakes and automatic couplers.

The Norfolk & Western last week placed with the Ensign Car & Manufacturing Co., of Huntington, W. Va., an order for 500 new box cars, to be completed and delivered as soon as possible. There has been a big revival of business on the Norfolk & Western the past three months, especially in coal and coke.

The Seaboard Air Line is not to build 1,000 freight cars, as has been frequently stated for some time past, nor will it build anything like that number. The company may shortly order additional box cars and it may not. The number to be built will be small in any event, and it is not unlikely that if new cars are ordered, they will be built at the company's own shops.

BRIDGE BUILDING.

Abbeyville, La.—The contract to build the street bridge across the Vermilion River, at Abbeyville, has been awarded to the Pennsylvania Bridge Company, of Beaver Falls, Pa., represented by Messrs. E. P. Alsbury & Son, of Houston, Tex., their bid being $10,550. There were 11 bids in all, as follows: The Ohio Bridge Company, Toledo, O., $12,530; New Columbus Bridge Company, Columbus, O., $11,263; Variety Iron Works, Cleveland, O., $10,999; Rapid Bridge Company, Cincinnati, O., $10,025; George C. King Bridge Company, Des Moines, Ia., $11,018; Toledo Bridge Company, Toledo, O., $10,900; King Iron Bridge Company, Cleveland, O., $10,900; Gillette-Herzog Manufacturing Company, Minneapolis, Minn., $10,850; Virginia Bridge Company, Roanoke, Va., $11,000; Converse Bridge Company, Chattanooga, Tenn., $11,300; Pennsylvania Bridge Company, Beaver Falls, Pa., $10,550. This bridge is to have a 170-ft. span, an 18-ft. wagon way and a 4-ft. passenger walk on both sides of the bridge. It will not be constructed before spring, but the contracts will be signed immediately.

Alexandra, S. D.—On Nov. 5 bids were opened by E. I. Gregory, County Auditor, for a bridge across Jim River. The contract was awarded to George C. Wise & Co., of Council Bluffs, Ia., for a steel structure to cost $1,800.

Atchison, Topeka & Santa Fe.—This company has made a contract with the Edge Moor Bridge Works for a 300-ft. bridge across the Canadian River near Purcell, I. T. The bridge company has the contract for both the substructure and the superstructure. The contractors have until the end of March, 1896, to complete the work.

Baltimore, Md.—The drawbridge recently built by J. M. Douglass & Co., over Bear Creek, on Weis avenue, has been completed, and the Commissioners have accepted it. It was opened to travel last week.

Boise City, Idaho.—Bids have been received at this place by Charles Stingsley, Clerk of the Board of County Commissioners, for a bridge over the Boise River.

Boston, Mass.—The Boston Bridge Works recently purchased in Aachen, Germany, three hundred tons of steel I beams for floor beams in the Cottage Row Bridge for which they have the contract with the city.

Bound Brook, N. J.—An overhead highway crossing of the Lehigh Valley Railroad is being built in the form of a steel lattice girder bridge, the contractors for which are the Elmira Bridge Company.

Buffalo, N. Y.—A plate girder bridge carrying Niagara street across the Hamburg Canal is being constructed by the Buffalo Bridge and Iron Works. It weighs about one hundred tons.

The Niagara Elevator Company has contracted with the Buffalo Bridge and Iron Works for a small drawbridge across the tracks of the N. Y., L. E. & W. and the Ohio Basin. C. W. Buchholz is consulting engineer.

Central of New Jersey.—J. S. Deans, Chief Engineer, Phœnix Bridge Co., writes: "The Phœnix Bridge Co. has received the contract for the high trestle on the Central Railroad of New Jersey, over the Little Schuylkill River, in the Schuylkill coal regions of Pennsylvania. This viaduct is over 175 ft. high and 1,000 ft. long, and when completed will be one of the largest and heaviest railroad structures in Pennsylvania."

Central Railroad of Georgia.—Contracts have recently been placed with the Edge Moor Bridge Works, Wilmington, Del., for single track steel bridges as follows: Chattahoochee River, six deck, Pratt truss spans, three spans 147 ft. long, c. to c. of end pins, one 149 ft., one 116 ft. and one 102 ft. Flint River, two through Pratt truss spans, each 113 ft. 9 in. long. Baker's Creek, one through Pratt truss span, 144 ft. 6 in. long. Fishing Creek, two deck Pratt truss spans, each 129 ft. long. Chewalla Creek, one deck Pratt truss span, 150 ft. 6 in. long.

These bridge works recently shipped a second crossing of the Flint River of two through Pratt truss spans, 112 ft. 9 in. long each, the erection of which has just been completed. R. W. Hildreth & Co., of New York, are employed as consulting and inspecting engineers.

Cleveland, O.—We noted last week that President Callaway, of the Nickel Plate road, had been notified by Mayor's Secretary McClure to construct the bridge over the tracks of the above road at Willson avenue. Mr. Callaway has replied to the effect that his company is willing to build such a bridge as will conform fairly to the requirements of the ordinance of April 1, 1882, granting the right of way through the city. That ordinance provides that the railroad shall, when so ordered, at its own cost, build and maintain a bridge over its tracks for the safe passage of vehicles and foot passengers. This should be, Mr. Callaway thinks, a bridge of wood, say 50 ft. wide, having approaches with a grade of 6 ft. in 100, to be replaced whenever necessary by steel or iron. Such a bridge will, it is thought, fully meet the public need. The city desires a much larger and more expensive structure of steel.

Delaware, O.—The contract for the new steel bridge over the Olentangy River, which we noticed in these columns some weeks ago, has been awarded to the Bellefontaine Bridge & Iron Co., of Bellefontaine, O., their bid being $4,250.

Easton, Pa.—The Union Bridge Co. has secured the contract for the Lehigh Valley bridge at this place, to connect that road with the Easton & Northern.

Grand Junction, Colo.—Press reports say that the Board of County Commissioners have added 1½ mills to the levy to strengthen the road fund, with the view of raising enough money to insure the building of the highway bridge at the Narrows, over Dry Creek, for which purpose the last Legislature appropriated $7,500. This additional levy will bring in about $3,000.

Hartford, Conn.—The Pennsylvania Steel Co. has recently completed an overhead crossing of the Consolidated and New England railroads at Park street.

Little Falls, N. Y.—The following bids were received for a bridge and abutments at German street on Nov. 12, Rochester Bridge & Iron Works, $7,446.40; Havana Bridge Works, Montour Falls, N. Y., $8,609.75.

Long Prairie, Minn.—The contract for the 55-ft. combination bridge at this place has been let to the Milwaukee Bridge & Iron Works, of Milwaukee, Wis.

Los Angeles, Cal.—C. S. Compton, City Engineer, writes: "The construction of a bridge across the Los Angeles River has been under contemplation and I have reported to the Council in regard to the plans and probable cost, but in my opinion it will not be constructed at present owing to other improvements now under way of greater necessity and requiring the use of the available city funds."

Marietta, Ohio.—The charter secured some time ago by the Marietta Bridge Co., for a steel highway bridge over the Ohio River, from Marietta, Ohio, to Williamstown, W. Va., has not been acted upon until recently, when an ordnance was passed by the city council of Marietta, granting the bridge company the right to construct landings and approaches in the city. The proposed bridge is to land at Third street, and will have a steel viaduct approach. J. H. Baker, representing the bridge company, announces that the company has secured the rights of way needed, and is ready to begin active operations.

Middletown, Pa.—The contract for the repairs and improvements on the aqueduct bridge at this place has been awarded to Nelson & Buchanan, of Chambersburgh, Pa. Their price for the work was $4,989.

Milwaukee, Wis.—A petition has been presented to the City Council of this place advocating the building of a bridge over the Menominee Valley at Twenty-seventh street. It is estimated that the structure will cost about $150,000.

Morgan County, Ill.—Frank J. Heinl, County Clerk of Morgan County, writes that H. Vortman has secured the contract for the wooden bridge near Chapin, Ill., bids for which were opened on Nov. 7, and that John Monroe has secured the contract for the bridge near Markham, for which bids were opened on Nov. 9.

Newark, N. J.—The question of the construction of a bridge from Fourth street, Harrison, over the Passaic River to Madison street, Newark, which it was estimated would cost about $110,000, was voted upon by the citizens of Hudson and Essex counties on Nov. 5, and the scheme was defeated.

New Haven, Conn.—The City Engineer of this place has prepared plans for a drawbridge over the Quinnipiac River at Grand avenue. The structure, it is estimated, will cost about $50,000.

New Orleans, La.—Proposals for constructing a bridge at Carrollton avenue have been received by C. R. Kennedy, City Comptroller. The lowest bid was $18,400, by John McNally, of New Orleans. We have not as yet received news of the award of the contract.

New York.—The New York Supreme Court, General Term (Judges O'Brien and Parker), decided last week that the New York & Long Island Bridge Co. has no right under its charter to construct connecting railroads on the New York side. The decision was on the application of the Bridde Company for condemnation of property at Third avenue and Sixty-fourth street. The plans for approaches to the bridge include a line westward to the New York Central, at Fourth (Park) avenue. The defect in the legislative act, under which the Bridge Company attempted to condemn real estate, lay in the fact that its title did not sufficiently describe its purposes. The constitution, section 16, article 3, provides that no private or local bill shall embrace more than one subject, and that subject shall be expressed in the title. This provision was not complied with.

The New York and New Jersey Bridge Company met at 214 Broadway recently and elected the following Board of Directors: Gen. James S. Clarkson, Des Moines, Ia.; John S. Runnells, Chicago, Ill.; William J. Latta, Philadelphia; the Hon. Daniel N. Lockwood, Buffalo, N. Y.; Louis Windmuller, New York; Frederick Potter, Potter Building, New York; Charles A. Smylie, New York; William Bell, New York; William H. Ely, New York; Lorenzo Duncan, Brooklyn; John Loughran, President of the Manufacturers' Bank, Brooklyn; Charles H. Swan, Brooklyn, and John C. Adams, Newburg, N. Y. Mr. C. H. Swan, Secretary of the Commission, said: "When we have secured the consent of the Sinking Fund Commissioners for the approaches to the bridge in this city we look for prompt action on the part of the War Department in the matter of location of the bridge, and when that is accomplished we shall be in a position to finance the project."

The Commissioners of the new East River bridge held a meeting on Nov. 19. Mr. Salem H. Wales, in behalf of the special committee, appointed to advise as to the width of the new structure, reported in favor of an extreme width of 118 ft., which would give room for two footways, two carriageways, and either four or six railroad tracks. Chief Engineer Buck submitted estimates of the cost of running four and six tracks over the bridge, and the matter was referred to the Executive Committee, who will investigate and suggest the adoption of the best plan.

New York, Lake Erie & Western.—The effect of the recent reorganization and the liberal provisions for repairs and renewals is shown in the matter of contracts for steel bridges recently placed. Previous to the reorganization this company arranged with the Passaic Rolling Mill Co. for the construction of Bridge No. 2, Delaware Division, across the Passaic River, which is now being erected. It consists of four double track Pratt truss spans, one 164 ft. 6 in. long, and three 153 ft. 9 in. each. The total weight is 1,300 tons. The recent contracts mentioned above are with the Elmira Bridge Co., as follows:

Rochester Division, No 7, two pin connected through spans, single track, 132 ft. long each; No. 8, three deck, plate girder spans, single track, 87 ft. 5 in. long each; No. 11, one plate girder span, single track, 65 ft. long.

Eastern Division, No. 3, at Berry Creek, designed for a four track plate girder bridge, two tracks to be built at present, consisting of a lift draw span with 25 ft. opening, and two deck spans 48 ft long each.

Susquehanna Division, No. 68, a double track deck plate girder bridge of four spans, each 48 ft. long.

Western Division, No. 5, single track, through plate girder span, 65 ft. long; No. 15, single track, deck plate girder bridge of two spans each, 107 ft. loug.

Mahoning Division, No. 3, at Scranton avenue, Cleveland, O., single track, through, plate girder span, 112 ft. long; No. 23, two through pin-connected spans, 133 ft. long each, single track.

Delaware Division, No. 29, single track, deck, plate girder span, 88 ft. long.

Buffalo Division, No. 3, Falls Branch, single track, through, plate girder span, 92 ft. long.

The Elmira Bridge Co. has sublet about half of the above steel work to the Union Bridge Co. Additional contracts will be placed during the winter.

Oakland, Cal.—On Oct. 31 it was decided by the Street Committee to recommend an ordinance to repair the bridge at Eighth street at a cost of $13,000, of which $9,000 is to be paid by the city and the balance by the street railroad and the Contra Costa Water Co.

Palm Beach, Fla.—The bridge over Lake Worth, erected by the Florida East Coast Railway Co. has been completed.

Parkersburg, W. Va.—The Little Kanawha River Bridge Co. has been organized to build a wire suspension bridge across the Little Kanawha River, from Parkersburg, to the south side of the river. The bridge is estimated to cost about $15,000. The incorporators are William Bentley and William Kirk, of Parkersburg.

Philadelphia, Pa.—The opening of Twenty-third street north from Girard avenue to Oxford street, to convert the former thoroughfare into a boulevard north from the Girard avenue bridge to the park entrance at Strawberry Mansion, involves the construction of two heavy bridges to carry the driveway across the tracks of the Reading and the Pennsylvania railroads and the raising of the new street 40 ft. above the present land level in order to overcome grades. The bridge over the Reading tracks is in two spans of 120 ft. and 105 ft. respectively, with an intermediate pier. The abutments for this bridge are now being built. Owing to the width of the bridge and its height, these abutments are very large pieces of work. The abutments for the bridge crossing the Pennsylvania are practically completed. This bridge will be 190 ft. long in one main span of 123 ft. and two shorter spans. The entire amount of stone estimated as necessary for the abutments for these two bridges is about 45,000 tons, of which 15,000 will be used in the single abutment for the Reading crossing, now being constructed. These bridges will all be deck plate girders.

Citizens of the Twenty-seventh Ward held a meeting recently for the purpose of urging upon the City Councils the necessity of placing a bridge over the Philadelphia, Wilmington & Baltimore Railroad at Seventy-first street. A committee was appointed to present the claims of the neighborhood to the Finance Committee of Councils.

Pittsburgh, Pa.—A board of viewers has been appointed to examine into the safety of the Tenth street bridge. The testimony of a number of engineers goes to show that the bridge, which is of wood, could be put in good repair for about $22,000, and that a new steel structure could be built for about $55,000.

Plymouth County, Iowa.—Press reports say that the Supervisors of Plymouth County, Iowa, and Union County, South Dakota, have decided to erect a steel bridge across the Big Sioux River, at Belle Vista Ranch.

Rapid River, Mich.—Bids will be received until Dec. 10 for an iron bridge at this place.

San Francisco, Cal.—An effort is being made here by the Castro Street Land Co. to have the Supervisors build two 105 ft. bridges across the Southern Pacific right of way.

Texas Central.—A single track, through, pin-connected bridge, 150 ft. long, across Aquilla Creek, and a deck, plate girder span, 90 ft. long, across Snake Creek, have been contracted for with the Edge Moor Bridge Works, of Wilmington, Del.

Toledo, O.—County Commissioner Pray has let the contract for an iron bridge over the canal on the Otsego road, in Providence Township, to the Ohio Bridge Co., for $1,180.

Topeka, Kan.—On Nov. 5 an election was held to consider the question of issuing $150,000 worth of bonds for constructing a bridge at this ploce. The vote resulted in favor of the plan.

West Chester, Pa.—A case was recently tried in the Court of Common Pleas here, concerning an action brought by the Edge Moor Bridge Works against the county of Delaware to recover a claim for the preparation of specifications for the Second street bridge at Chester. The case was decided in favor of the plaintiff, a verdict being given for $875.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Belleville & Southern Illinois, 3¾ per cent. on the preferred stock, payable Nov. 6.

Delaware & Bound Brook, quarterly, 2 per cent. on guaranteed stock, payable Nov. 20.

North Pennsylvania, quarterly, 2 per cent. on capital stock, payable Nov. 25.

Rome, Watertown & Ogdensburg, 1¼ per cent., guaranteed by New York Central & Hudson River.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Illinois Central, special, Chicago, Nov. 26, to authorize an increase of the capital stock by $10,000,000.

Montreal & Western, special, 162 St. James street, Montreal, Que., Nov. 27.

New York, Lake Erie & Western, annual, 21 Court landt street, New York City, Nov. 26.

Pittsburgh & Connellsville, annual, offices B. & O., corner Smithfield and Water streets, Pittsburgh, Pa., Dec. 2, 11 a. m.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The American Society of Mechanical Engineers will hold its annual meeting at the Society's rooms, 12 West Thirty-first street, New York City, Dec. 3 to 6.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

Guarantee Ticket Brokers' Association.

This Association held its annual meeting at Buffalo last week. The election resulted in the choice of Mr. J. W. Varnes, of Cleveland, as President, and Mr. J. R. Fleishman, of Buffalo, Treasurer.

New York Railroad Club.

The annual meeting of the Club was held Thursday evening, the 21st. The annual election of officers took place.

There was a topical discussion on the subject: "Is it Good Policy for a Railroad to Manufacture, to any Considerable Extent, in its Own Shops, Articles for Repairs to either Cars or Locomotives that can be Purchased in the Open Market?"

Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held at the Great Northern Hotel, Chicago, Nov. 20, at 7:30 p. m. The new by-laws, which have been in course of preparation for several months, were presented and discussed. There were two papers presented at this meeting, one by Mr. Thomas D. West on Stretching Cast Iron, and Principles Involved in its Contraction; the other was by Mr. J. W. Keep, entitled Properties of Cast Iron Shown by Keep's Cooling Curves. These two papers were interesting, and we hope to give abstracts of them later.

The National Association of Manufacturers.

The following announcement has been issued by the Secretary, E. P. Wilson, of Cincinnati: The following proposition has been adopted by the Executive Committee of the National Association of Manufacturers:

WHEREAS, experience in organizing a constituency for the convention of this Association, at Chicago, has developed a work of greater magnitude than was originally anticipated.

WHEREAS, The period in which this work of organization was undertaken has been largely taken up in political matters, it is therefore

Resolved, That the time for holding the annual convention be postponed and fixed for Tuesday, Jan. 21, 1896, at Chicago.

Northwest Railway Club.

The club held its annual meeting at the Ryan Hotel, St. Paul, on Nov. 12. Secretary Seeley's paper on "Lead in Locomotives," read at the last meeting, was discussed, and William McIntosh read an interesting paper on "Lesson of the Hard Times," which will be discussed at the next regular meeting. The following officers were elected for the ensuing year: President, George D. Brooke, Master Mechanic St. Paul & Duluth; Vice-President, George Dickson, General Foreman Great Northern; Second Vice-President, E. A. Westcott, Master Car Builder Great Northern; Treasurer, J. O. Patty, Superintendent of Motive Power of the Great Northern; Secretary, T. A. Foque, Assistant Mechanical Superintendent Soo Line; Assistant Secretary, W. C. Dallas, of a supply house.

At this meeting 27 applications for membership were received.

Engineers' Club of St. Louis.

A regular meeting was held Nov. 6, President Russell in the chair, 22 members and five visitors present. Prof. Chas. C. Brown's paper on The Sewerage of Indianapolis was read by Mr. B. H. Colby. The paper explained the peculiar features of the problem, and was illustrated by drawings and maps showing the general features, as well as details of the several interesting forms of special construction. The methods of carrying on the work and its extent and cost were explained. The country being flat, little or no fall was available.

The discussion was participated in by Messrs. Robert Moore, Kineally, Flad, Olshausen, J. B. Johnson, Sherman, Pitzman, Hermann, Maltby, Bouton and President Russell.

Mr. Moore gave some further details of the situation, size of streams, etc. The life of ironwork painted with asphalt was discussed. The difficulty of getting good construction in masonry was mentioned, as was also the subject of water pollution and protection of water sheds.

The Railway Signaling Club.

The regular meeting of the Railway Signaling Club for November was held at the Great Northern Hotel, Chicago, on the evening of Nov. 12. After the transaction of some minor matters of business, a brief discussion was held upon the paper by Mr. H. D. Miles, upon "Some Features of Interlocking Construction upon the Michigan Central Railroad," which was published in the *Railroad Gazette* of Nov. 8. It was thought by Mr. Elliott that the prices given by Mr. Miles for the concrete foundations were too low to be correct, and that, as the top plank and bolts were required anyway, the use of concrete as a material for the body of the foundation caused unnecessary expense. To this Mr. Miles replied that whereas the life of a wooden foundation was, at the best, only six or seven years, the cement would never wear out, and therein would lie a great gain. Mr. Elliott then suggested that it might be sufficient to cement crank and commensator foundations a little more securely and thoroughly, which would increase their lives, but it was answered that this would not prevent the decaying of the wooden structures, which limits the length of their usefulness. Mr. Sperry thought that cement foundations could not be manufactured to advantage upon the ground by the employees of the signal companies, owing to the great care which is required to properly mix the concrete, and the uncertainty which would exist in this work.

Iron signal poles were next considered. The cost of splicing a wooden pole was shown to be about $15. On the Michigan Central the decision to use iron poles was reached after a man had been killed by falling with a wooden pole which had rotted at the ground, and after another pole had fallen directly across the track. The life of wooden poles was shown to be sometimes as short as three years, which was considered a strong argument in favor of the use of iron.

A paper upon electric locking of interlocking plants was then read by Mr. W. H. Elliott, Signal Engineer of the Chicago, Milwaukee & St. Paul, which will be published in a later issue. This was briefly discussed, and the author stated that such apparatus as he described could be applied to an ordinary grade crossing for about $135.

After the adjournment of the meeting there was an exhibition of the apparatus of the Sheeby Automatic Railroad Signal Co., of 122 Pearl street, Boston, which was explained by Mr. R. J. Sheeby, President of the company, by the aid of a working model.

American Society of Civil Engineers.

A paper on "The Discharge of the Mississippi River," by William Starling, M. Am. Soc. C. E., was announced in the *Bulletin* for presentation to the Society on the evening of Nov. 6, 1895; and one by Robert Brewster Stanton, M. Am. Soc. C. E.; entitled "Notes on the Construction of a Water System for Placer Mining, and Suggestions for a New Method of Dam Building," was to have been read Nov. 20, 1895.

At the meeting of Nov. 6, in the absence of the author, the Secretary read an abstract of Mr. Starling's paper, after which, by vote of the meeting, it was decided to postpone the further consideration of this paper until the 20th instant, and to take advantage of the unexpected presence of Mr. Stanton for the reading and discussion of his paper. The paper by Mr. Starling will appear in the *Transactions* for Nov. 1895, now in press, and its discussion was the order for the meeting of Nov. 20, 1895.

At the meeting to be held Dec. 4, 1895, a paper will be presented by George Hill, Assoc. M. Am. Soc. C. E., entitled "Tests of Fire-Proof Flooring Material." The paper will be illustrated by lantern slides, and an abstract will be published in the next Bulletin.

At a meeting of the Board of Direction held Nov. 5, 1895, the following change in the method of issue of the publications of the Society was adopted, to take effect Jan. 1, 1896:

1. The *Bulletin* to be discontinued.
2. Ten numbers of *Proceedings* to be issued during the year. These issues to be made promptly on the fourth Wednesday of each month, except in June and July.
3. Each number of *Proceedings* to contain the minutes of the meetings of the month of issue, except that the number for August will contain the minutes of the first meeting in June and also of the annual convention.
4. The *Proceedings* will also contain the other matter now printed in *Proceedings* and *Bulletin*, except abstracts of papers.
5. Each number of *Proceedings* will contain in full, but without discussion (and in most cases without plates), the papers to be read and discussed at the second meeting of the following month, and the first meeting of the second month thereafter. Under this arrangement an advance copy of every paper will be in the hands of members at least three weeks before its presentation for discussion. The May number will contain the papers to be presented at the convention and possibly at the first September meeting.
6. The monthly issue of *Transactions* to be discontinued. The papers, with complete discussions, both oral and by correspondence, to be issued from time to time in volumes of about 600 pages, these volumes to be sent in paper covers. Arrangements will also be made for furnishing these volumes bound in cloth, half morocco or other suitable binding, to members or subscribers who desire them in that form and are willing to pay the small extra cost of the same.
7. Under this arrangement and with the present amount of *Transactions* the Society will continue to issue 12 publications yearly, of which 10 will be *Proceedings* and two will be volumes of *Transactions*.

American Society of Mechanical Engineers.

The Sixteenth Annual Meeting of the American Society of Mechanical Engineers will be held at its house in New York, Dec. 3 to 6.

The convention will open at 9 p. m. Tuesday evening, Dec. 3, the first business being discussion of topical questions. At this meeting the President will appoint tellers to count ballots for officers. The house will be open early and it is expected that members will meet for conversation, and it is hoped that ladies will also come.

Wednesday morning at 10 a business session will be held at which reports of standing committees and of the tellers will be received and other business transacted. Any remaining time of this session will be taken up by reading professional papers and with topical discussions. Luncheon will be served in the house.

Wednesday afternoon is without definite assignment, but it is believed that excursions will be made up and that members will enjoy each other's society in various ways.

Wednesday evening professional papers will be read, as will be the case at the session of Thursday morning, when topical discussion will also be had and luncheon served in the house.

Thursday afternoon also is without assignment. Thursday evening there will be a reception at Delmonico's with supper and dancing.

Friday morning the closing session will be held, at which professional papers will be read and topical discussion will be had and the concluding business will be transacted. It is announced that the summer meeting will probably be held in St. Louis.

Cards of admission have been prepared to 17 different places of interest at the office and which will facilitate their visits. A list of papers and their authors, also subjects for topical discussion, follow:

PAPERS.

McElroy, Samuel: Water Power of Caratunk Falls, Kennebec River, Me.

Weber, Samuel: Water Power; its Generation and Transmission.

Emery, C. E.: Means Adopted for Saving Oil in a Large Oil Refinery.

Dalton, James E.: The Reliability of Throttling Calorimeters.

Goubert, A. A. & Peabody, E. H.: Some Experiments with the Throttling Calorimeter.

Emery, C. E.: Comparative Tests of Steam Boilers with Different Kinds of Coal.

Kingsbury, Albert: Experiments on the Friction of Screws.

Goss, W. F. M.: Tests of a 10-H. P. De Laval Steam Turbine.

Bissell, Geo. W.: Recording Device for Testing Machines.

Carpenter, R. C.: Effect of Temperature on the Strength of Wrought Iron and Steel.

Chamberlain, P. M.: Some Data Relating to Forge Shop Design.

Jacobus, D. S.: Experimental Method of Determining the Effective Center of the Light Emitted from a Standard Photometric Burner.

Barr, Jno. H.: The Proportions of High Speed Engines.

TOPICAL DISCUSSIONS.

For filtering oil having finely divided metallic particles in suspension, what have you found to be the best filtering material, either for one operation or in a series?

What information can you give as to the best method for the extraction of oil from condensed steam, where it is desirable to use the exhaust steam repeatedly for boiler feed purposes?

What is the economy, if any, of damper regulation in firing with liquid or gaseous fuel?

In boilers fired with liquid or gaseous fuel, is there any advantage in simultaneous regulation of the fuel supply and the position of the damper, either by the same or by different mechanisms under the ordinary control of the steam pressure?

Are there any conditions under which oil fuel is cheaper than coal for generating steam at points in the Atlantic seaboard states; if so, what are they, and where?

Is an air chamber of any value on a duplex boiler feed pump of 4-in. to 6-in. stroke?

Has any member had experience in planning a successful working system of classification which is better than the Dewey system for books in an engineering library?

In a centrifugal pump at constant speed, how is the efficiency affected (a) by throttling the delivery; (b) by a by-pass?

In a centrifugal pump receiving water under a head, does the whole amount of the head add to its normal lift?

What is the common method and best practice for determining the largest sizes of pipe desirable to use in mill heating, both by live and exhaust steam?

In the operation of annealing tool steel, what is the essential or principal condition to be observed to insure the best success?

What rule is there for determining approximately the horse power required to drive disk fans for exhausting and ventilating?

Has any one found it to pay to exhibit in recent International Exposition-, where to do so entails a cost of attendance, transportation and other heavy charges?

Is there any reliable method for calculating the cost of one machine if the cost of a larger number is known; or, conversely, if you know the cost of one machine, can the cost of building a larger number of the same machine be satisfactorily calculated?

Has any term ever been suggested to discriminate between the elastic resistance offered by a body to a force tending to change its shape and that offered by the same body to a force tending to change its volume? How much of the latter kind of elasticity has India rubber?

PERSONAL.

—Dr. S. S. Parkhill, of Hornellsville, has been elected President of the New York State Association of Railway Surgeons.

—Mr. W. S. Roney, who is Auditor of the Vandalia road, has been recently elected President of the Indiana Y. M. C. A. Association.

—Mr. Robert C. Pruyn, President of the Commercial Bank of Albany, has sold his interests in the Ulster & Delaware road and retired from the position of Vice-President and Director.

—Major Alfred F. Sears, M. Am. Soc. C. E., delivered a lecture before the members of the American Geographical Society in Chickering Hall, New York, on Nov. 18, the lecture being entitled The Geographical Conditions That Make Commercial Cities.

—Mr. J. E. Rugg, Superintendent of the Citizens' Traction Co., of Pittsburgh, has resigned and will go to Boston, where he has been appointed Manager of the West End lines. Mr. Charles Fitzgerald, Chief Engineer of the Citizens' Traction Co., has been appointed to fill the vacancy made by Mr. Rugg's resignation.

—Mr. Henry C. Ashton, inventor of the well-known Ashton safety valve, died at his home in Summerville, Mass., on Nov. 12. Mr. Ashton had not been in active business for a number of years. He invented the valve which bears his name about 1872 while connected with the Hinckley Locomotive Works as Superintendent.

—Mr. Frank Toumey has been appointed Master Mechanic of the Rochester division of the New York, Lake Erie & Western. He is at present foreman of the company's shops at West Newburgh, and has held the position a number of years. The present Master Mechanic of the Rochester Division, Mr. Hibbetts, was recently appointed Trainmaster of the Eastern Division.

—Hon. C. C. McChord, of Springfield, has resigned as a member of the Board of State Railroad Commissioners of Kentucky, and Governor Brown has appointed Joseph N. Saunders, of Stanford, his successor. Mr. Saunders is a young lawyer who has been a member of the State Legislature. He will only have a short term to serve

under his present appointment, Senator McChord's term expiring on Jan. 1 next.

—Mr. Jeff Lane has been appointed General Superintendent of the Georgia Southern & Florida, being as such at the head of the operating department. The office of General Manager, which was held by Mr. W. B. Sparks, the former Receiver, has been abolished, Mr. Sparks retiring from the service of the company. Mr. Lane has heretofore been Superintendent and has held that office practically since the opening of the road for operation.

—Vice President Murray, of the Cleveland, Cincinnati, Chicago & St. Louis, will, it is understood, remove his headquarters from Cincinnati to New York City, though continuing as Traffic Manager of the road. He is to be the Representative of the Chesapeake & Ohio and the Big Four on the Board of Managers provided for in the new Trunk Line agreement, and his removal to New York will enable him to more conveniently attend to such duties.

—Mr. Thomas W. Anderson, the Local Freight Agent of the Wabash road at St. Louis, Mo., died of apoplexy in St. Louis last week. Mr Anderson had been Local Freight Agent of the Wabash at St. Louis and East St. Louis since November, 1891. He had held the office of Trainmaster between St. Louis and Moberly, Mo., before his appointment as Local Freight Agent. Previously he had been a Division Superintendent of the Texas & Pacific road. He was President of the Local Freight Agents' Association last year.

—Mr. W. J. Karner has been appointed General Manager and Treasurer of the Crown Coal & Tow Co., of St. Louis, and General Manager of the St. Louis, Belleville & Southern Railroad, which operates about ten miles of road near East St. Louis. The Crown Coal Company owns valuable mining property in the Illinois coal fields near Belleville, and has financial interests in the railroad company whose line extends through this property. Mr. Karner was formerly an engineer in the office of Mr. E. L. Corthell, acting also in a confidential capacity.

—Mr. Albert Johnson, a locomotive engineer on the Seaboard Air Line, who ran the first locomotive used on the Raleigh & Gaston, now one of the divisions of the Seaboard Air Line, has been pensioned by the directors and retired from active service. He is now over 90 years old and has been in continuous service on the lines of the Seaboard Air Line since he went over the road with the first locomotive a little over 50 years ago. At present he is at the Atlanta Exposition in charge of the model of the "Tornado," the engine used in making the initial trip on the road.

—Hon. John M. Thurston, United States Senator-elect from Nebraska, has formally resigned his office as General Attorney of the Union Pacific, which he has held for a long number of years. Senator Thurston will take his seat in the Senate at the opening of Congress in December next. He states that he has prepared a bill for settling the Government's claims against the Pacific roads, on the line of the plan outlined by him some time ago. One suggestion is that the Government make a statement of the amount of its claim by July 1 next, this claim be offered for sale to the highest bidder.

—Mr. George F. Randolph has resigned as General Traffic Manager of the New England road, and Mr. J. M. Williams, at present General Eastern Agent of the Old Colony Division of the New York, New Haven & Hartford, has been placed in charge of the freight traffic of the New England. Mr. C. H. Goodrich, the former General Freight Agent of the New York & New England, has also resigned. Mr. Randolph went to the New York & New England in 1892 when Mr. McLeod was President of the company. Shortly afterward he was transferred to the Philadelphia & Reading as Assistant General Freight Agent, but returned to the New England road in 1893, when he became General Traffic Manager.

—Mr. W. B. Sparks has resigned as General Manager of the Georgia Southern & Florida, and the direct management of the company has been assumed by Vice-President William C. Shaw, of Baltimore. Mr. Shaw was President of the company while the reorganization was in progress, being succeeded in that office by Mr. Spencer, of the Southern Railway, when that company assumed control of the Georgia Southern. Mr. Sparks has been Receiver of the company and identified with the property practically since its incorporation. He was President and General Manager of the company during its construction, as well as the head of the Macon Construction Co., which built this road, and also the Macon & Birmingham. He was appointed Receiver in 1891, and continued in that position until the organization of the new company, although more than one attempt was made by opposing security holders to have a new Receiver appointed.

—Mr. C. C. Elwell, Roadmaster of the New York division of the New York, New Haven & Hartford, has been appointed Division Superintendent of the New England road, with headquarters at Norwich, Conn. Mr. Elwell has been with the New Haven road since early in 1893, and has had important duties and responsibilities on the extensive four-track improvement of the New York division of the New Haven, which has been going on for the last few years. That work has given him opportunity for the exercise of excellent engineering skill, which had already been proved on the Pittsburgh & Western, of which he was Chief Engineer. When that road was made a division of the Baltimore & Ohio, Mr. Elwell was appointed Engineer of Maintenance of Way of the division. He was one of the delegates selected by the Directors of the New Haven to represent that company at the International Railway Congress in July last.

—Mr. Barton Hoopes, senior member of the widely known firm of Hoopes & Townsend, of Philadelphia, manufacturers of bolts, nuts, rivets and similar articles, died in Philadelphia last week. Mr. Hoopes had not been in active business for a year or more past, having been attacked with paralysis early in 1894. Mr. Hoopes' first business connection was in Wilmington, Del., where, after serving as an apprentice to a firm of machinists, he established the firm of Hoopes & Brown. In 1852 the business was removed to Philadelphia, and the firm became Hoopes & Townsend, and has continued under that style ever since, although in recent years the firm has comprised only Mr. Hoopes and his three sons. The business has always been prosperous, and the establishment is now pretty nearly ten times as large as the works first started at Philadelphia. It covers a large tract of land on Broad and Buttonwood streets, and employs about 700 men.

—Mr. E. P. Bryan, of St. Louis, Superintendent of Terminals of the Loisville & Nashville, is the new General Manager of the Terminal Railroad Association of St. Louis. He is to assume the duties of that office by Jan. 1, when Mr. Joseph Ramsey, Jr., retires to enter upon the office of General Manager of the Wabash road, where he succeeds Mr. Charles Hays, who goes to the Grand Trunk. Mr. Bryan is now a member of the Directorate of the Terminal Railroad Association, being the Louisville & Nashville representative on the Board and a member of its executive committee, so that he takes up work with the requirement of which he is perfectly familiar. He has been in the service of the Louisville & Nashville for about 30 years, entering its employ as a telegraph operator. He has held various positions both in the traffic and transportation departments, and in March, 1892, was transferred to St. Louis as Superintendent of Terminals. He had previously been in charge of the Louisville terminals for a number of years.

ELECTIONS AND APPOINTMENTS.

Albuquerque, Colorado & Pacific.—The incorporators named in the new articles of incorporation in Denver are: J. W. Hanna, President: W. W. Borst, Vice-President; J. C. Veatch, Secretary; Geo. W. Wilson, Treasurer, and E. T. Wells, Counsel. The Directors are: J. W. Hanna, E. Lewis, W. W. Borst, Geo. W Wilson, J. C. Veatch, S. A. Osborne, Denver; M. S. Otero, G. L. Brooks, H. B. Ferguson, Albuquerque.

Baltimore & Ohio.—The annual meeting was held at Baltimore, Nov. 18, and four new directors, representing large security-holding interests of the company outside of Maryland, were elected. The new members of the Board are General Louis Fitzgerald, President of the Mercantile Trust Co., New York; Eugene Delano, of Brown Bros. & Co. London and New York; William A. Read, of Vermilye & Co., New York, and Howland Davis, of Blake, Boissevain & Co., London. The other members of the directory re-elected are William F. Burns, William H. Blackford, William F. Frick, Maurice Gregg, George C. Jenkins, Aubrey Pearre, Alexander Shaw and George A. von Lingen.

Central Washington.—Receiver Chamberlain has appointed L. C. Barry Auditor and F. R. Hanke Freight and Passenger Agent of this road, which is hereafter to be operated as an independent line. The headquarters will probably be at Spokane, Wash.

Chicago Junction Railways & Union Stock Yards Company.—The stockholders held their annual meeting in Jersey City, Nov. 14. Directors and officers were elected as follows: C. M. Depew, William J. Sewell, Frederick H. Winston, Frederick H. Prince, Albert H. Veeder, Edward J. Martyn, Martin L. Sykes, George P. Gardner, W. Scott Fitts and Nathaniel Thayer. Chauncey M. Depew was re-elected President: William J. Sewell, Vice-President; Thomas Sturgis, Treasurer, and William C. Lane, of 45 Broadway, New York, Secretary.

Choctaw, Oklahoma & Gulf.—W. E. Pollock has been appointed General Roadmaster of the road, with headquarters at Shawnee, I. T.

Columbus, Sandusky & Hocking.—These appointments took effect Nov. 15: A. W. Dunning, Auditor and Treasurer; Wm. Thornburgh, General Superintendent; W. W. Daniel, General Freight Agent; B. H. Adin, General Passenger Agent, all with offices at Columbus, Ohio. The office of Purchasing Agent is abolished.

Denver & Rio Grande.—The directors of the company have re-elected George Coppell Chairman of the Board; E. T. Jeffery, President; William Wagner, Secretary; J. W. Gilluly, Treasurer; J. B. Andrews, Assistant Secretary, and Jesse Hoyt, Assistant Treasurer.

Gulf & Interstate.—E. E. Stoup has been appointed General Superintendent in charge of transportation, traffic and car service departments, with headquarters at Beaumont, Tex.

Hoosac Tunnel & Wilmington.—The general offices of this company, which were at Holyoke, Mass., are now at Wilmington, Vt.

Knoxville & Ohio.—The new Board of Directors is as follows: A. B. Andrews, Raleigh, N. C.; W. H. Baldwin, Jr., Washington, D. C.; C. H. Castor, John Greenough, Samuel Spencer, H. S. Chamberlain, Chattanooga; E. J. Sandford and C. M. McGhee, Knoxville, Tenn.

Manhattan.—At the annual meeting of the stockholders of the company, on Nov. 13, the following directors were elected: R. M. Gallaway, Russell Sage, Samuel Sloan, George J. Gould, George Bliss, F. K. Hain, Edwin Gould, Joseph Eastman, G. P. Morosini, Donald Mackay, Howard Gould and Warren B. Smith in place of Simon Wormser, deceased. George J. Gould was chosen President, Colonel Hain Vice-President and D. W. McWilliams Secretary and Treasurer.

Meriden, Waterbury & Connecticut.—The new directors, representing the majority interest of the New York, New Haven & Hartford, are J. M. Millard, of Meriden, Conn.; C. P. Clark, J. W. Hall, of New Haven; C. F. Brooker, of Torrington, Conn., and Carlos French, of Seymour. The following members of the old board of directors continue, representing the minority stockholders: D. S. Plume, A. S. Chase, E. D. Steele, of Waterbury, and C. D. Rogers, of Meriden.

New England.—The first annual meeting of the company was held at Hartford, Conn., on Nov. 14. The following directors were elected by a stock vote of the 184,482 shares, 172,687 common and 11,795 preferred, represented at the meeting: William T. Hart, Francis L. Higginson, N. W. Rice and Charles L. Lovering, Boston; Jesse Metcalf and Gorham P. Pomroy, Providence, R. I.; Frederick J Kingsbury and D. S. Plume, Waterbury, Conn.; Charles P. Clark, New Haven, Conn.; Robert Bacon, New York and John W. Doane, Chicago.

A majority of the stock of the road, which consists of 200,000 shares common and 50,000 shares preferred, was voted in the interest of New York, New Haven & Hartford road. President Clark, of that road, also held the proxies of the proportion of the minority stock voted which was not represented at the meeting. The following officers were elected: President, Charles P. Clark, of New Haven, President of the New York, New Haven & Hartford; Vice-President, William T. Hart, of Boston; Secretary, James W. Perkins, of Boston; Treasurer, G. B. Phippen, of Boston. J. T. Odell was re-elected General Manager.

Mr. J. T. Odell as Second Vice-President and General Manager, issues the following announcements: George F. Randolph having resigned as General Traffic Manager of this company, that office has been abolished; J. M. Williams has been appointed General Freight Agent of this company, vice C. H. Goodrich, resigned. The duties heretofore performed by the General Traffic Manager will devolve upon the General Freight Agent. The office of the General Freight Agent will be at No. 180 Summer street, Boston, Mass.

New York, Lake Erie & Western.—The temporary board of directors named in the certificate of incorporation of the new company is as follows: Temple Bowdoin, C. H. Coster, J. H. Emanuel, Jr., A. H. Gillard, A. B. Hopper, Thomas W. Joyce, Walter S. Kenneys, J. P. Morgan, Jr., Francis Lynde Stetson, Mortimer F. Smith, W. S. Townsend, J. H. Tierney and E. B. Thomas. This board has elected officers, as follows: President, Eben B. Thomas; Third Vice-President, Andrew Donaldson; Fourth Vice-President, G. G. Cochran; Secretary, J. A. Middleton; Treasurer, Edward White.

New York, New Haven & Hartford.—The annual meeting of the Directors for the election of officers was held last week, and the following were chosen for the ensuing year: President, Charles P. Clark, of this city; Vice-President, John M. Hall, of this city; Secretary, W. D. Bishop, of Bridgeport, and Treasurer, W. L. Squire of New Haven.

Pennsylvania Co.—Several changes in the engineering department of the Pennsylvania lines west of Pittsburgh went into effect last week. William C. Wood, Jr., of Fort Wayne, a nephew of General Manager Wood, has been made Assistant Engineer of Maintenance of Way of the Cleveland & Pittsburgh division, and his former position has been filled by W. C. Hezlup, of Lawrence Junction, Pa. Louis Hass has been appointed Engineer of Maintenance of Way of the Pittsburgh, Fort Wayne & Chicago, which position had been vacant since the appointment of C. S. Sims to the office of engineer of the Toledo division. Mr. Hass comes from the Southwestern system.

Peoria, Decatur & Evansville.—Mr. William E. Strong, of the New York Stock Exchange house of Work, Strong & Co., has been elected President of the company.

Petersburg.—The annual meeting of the stockholders was held at Richmond, Va., Nov. 18. President Warren C. Elliott was re-elected, and also H. Walters, Vice-President, and the following directors: Messrs. H. Walters, B. F. Newcomer, F. R. Scott, D. E. Lasseter, Waldo Newcomer and Warren G. Elliott.

Richmond & Petersburg.—At the annual meeting at Richmond, Va., Nov. 18, Major F. R. Scott was re-elected President; Mr. H. Walters, Vice-President, and the following Directors: Messrs. H. Walters, B. F. Newcomer, D. E. Lasseter, D. G. Elliott and Michael Jenkins.

Seaboard Air Line.—Following are the new Boards of Directors of the Raleigh & Gaston and Raleigh & Agusta divisions of this system, elected at the meetings held at Raleigh, N. C., last week. With a few exceptions they are re-elections: Raleigh & Gaston: Louis McLean, C. D. Fisher, W. W. Chamberlain, W. C. Stronach, Jos. B. Batchelor, W. R. Tucker, Raleigh & Agusta: R. C. Hoffman, Louis McLean, J. L. Minis, W. W. Chamberlain, C. D. Fisher and B. N. Duke.

Seaboard & Roanoke.—The annual meeting of the stockholders of the company, which was adjourned on October 1, was held in Portsmouth, Va., on Nov. 13. R. C. Hoffman was re-elected President, and Enoch Pratt, Louis McLane, Moncure Robinson, Chas. D. Fisher, L. R. Watts and W. W. Fuller Directors for the ensuing year. E. St. John was re-elected Vice-President, and other officers remain the same.

St. Louis, Aton & Terre Haute.—At the regular annual meeting of the Board of Directors, held at St. Louis last week, the following officers were elected: George Foster Peabody, Chairman Board of Directors; George W. Parker, President and Treasurer; E. F. Leonard, Secretary; H. T. Nash, Auditor; Clarence F. Parker, Assistant General Manager; W. S. Wilson, Superintendent, and George E. Lary, General Freight and Passenger Agent.

St. Louis Merchants' Bridge & Terminal.—Stockholders of the company held their annual meeting at St. Louis last week, and elected the following directors: C. C. Rainwater, Chas. D. McLure, D. R. Francis, L. M. Rumsey, J. N. Bofinger, J. J. Taussig, Edward Walsh, J. H. Dieckman, William Duncan, H. D. Houser and S. D. Webster.

RAILROAD CONSTRUCTION,

Incorporations, Surveys, Etc.

Akron & Pittsburgh.—The surveys out of Akron, O., for this newly incorporated company are steadily going forward. Instead of following the route of the old Akron & New Castle, as originally intended, the surveyors are now running a line through Cuyahoga Falls east to Kent, and then paralleling the Pittsburgh & Western to New Castle. No line will be built to Cuyahoga Falls if these plans are carried out, but the track of the Cleveland, Akron & Columbus will be used instead. This road is one of the extensions of the Lake Erie & Western, projected by President C. S. Brice.

Albany, Helderberg & Schoharie.—This company was incorporated last week at Albany, N. Y., to build a road from Albany to Schoharie, N. Y., a distance of 30 miles, to be operated by electricity, locomotive steam power or compressed air. Capital, $300,000. The directors are Jonas H. Brooks, B. M. Secor, John W. Van Valkenburgh, Robert J. McCauley, of Albany, and others. The company will have its principal office in Albany.

Alvin, Brazoria & Western.—The projectors are arranging to make a preliminary survey of the line from Alvin, Tex.

Ashland, Siskowit & Iron River.—Articles of incorporation were filed at Ashland, Wis., on Nov. 7, for this company. The incorporators are J. W. Cochran, C. F. Latimer, I. P. Newton, George W. Johnson and W. F. Pleas. The capital stock is $100,000, and the principal office is to be in Ashland, Wis. The route of the proposed line is not given.

Baltimore & Ohio.—It is announced that work will begin early in the spring on the proposed Short Line, a road surveyed and commenced about 10 years ago, from Washington, Pa., on the Pittsburgh & Wheeling Division, by a direct line across the Monongahela River, to Coal Centre, on the main line, near Connellsville. The distance would be materially shortened for all coke and coal freights from the Connellsville region west, and would relieve the yards about Pittsburgh of handling this freight. This branch was commenced some years ago, and a large sum spent upon it, but no effort has been made to complete it. The right of way is held, and much grading and filling has been done.

Belton & Northeastern.—The application of the road for authority to issue bonds to the amount of $12,000 a mile on 28 miles of road, from Belton to McGregor, Tex., has been granted by the Texas Railroad Commission. Arrangements have already been made with Eastern

capitalists for the money to construct the road, which will be pushed as rapidly as possible.

Calvert & Brazos Valley.—The incorporation of this road in Texas was noted last week. It appears that the road is to be practically an extension of the existing Hearne & Brazos Valley road, and is to be built through the rich lands known as the Brazos bottom lands for nine miles to the town of Calvert, Tex. It begins at the junction of the Hearne & Brazos Valley and International & Great Northern roads and extends along the river to Calvert. W. S. Allen, L. T. Fuller and others, of Calvert, Tex., are the incorporators.

Chicago & Northwestern.—The branch from Aniwa to Mattoon, Wis., is being extended south to the Chase saw mill, a distance of six miles. The Mattoon Manufacturing Company, which has a lease of this branch for a term of years, will clear a right-of-way, grade the roadbed and furnish the ties, and the Chicago & Northwestern will lay the rails.

El Paso & White Oaks.—The El Paso City Council has granted an extension of 60 days' time for the commencement of work on the "White Oaks road," under franchise granted by the city to J. L. Bell and associates, of Chicago. The franchise for building the road into the city would have expired Dec. 1 if work had not been commenced before that date. The road is to run from El Paso, Tex., to White Oaks, N. M., then on to Panhandle City to tap the Rock Island.

Florida East Coast.—Vice-President Parrott reports that construction work on the new line between West Palm Beach and Miami, Fla., has been delayed somewhat by the heavy rains of the past month in Southern Florida; but every indication points to the completion of the road to Biscayne Bay before February 1. Track laying is in progress between West Palm Beach and Linton, the first town south of Lake Worth. The greater part of the grading of the whole extension is already finished.

Galveston, La Porte & Houston.—It is now claimed that this road will be ready for operation as a through line between Houston and Galveston by Dec. 1. The last rails are now being laid, and the bridge across West Galveston Bay, which has done so much to delay the completion of the road, is now erected. The opening of this road between these two points gives a line 50 miles long between the two cities and makes the third railroad in operation between Houston and Galveston. There has been some talk of the use of the line as a Galveston outlet by the Missouri, Kansas & Texas, and the Houston, East & West Texas, but it is said that very considerable improvements would be required in the roadbed before the line could be used for heavy traffic.

Jackson Southern.—Grading on this line, which is being built from Jackson, Minn., to Ruthven, Ia., under arrangements with the Minneapolis & St. Louis, is pushing grading and will be running trains next June. The Minneapolis & St. Louis has plans for several short links and connections in Minnesota and Iowa that will give it many new feeders.

Lima & Northern.—The contractors are continually increasing the number of men employed on the section being built north of Lima, O., and the construction force is now very large. This line is one of the roads purchased within the last few months by Mr. Calvin S. Brice, President of the Lake Erie & Western, and which is to be operated as a leased line of that company. The work now going on is from Lima north, about 35 miles, with a junction with the Toledo, St. Louis & Kansas City road, and it is expected to complete this division by January. W. B. Strong & Co., of Wall street, New York City, have the contract for this work, which has been sublet in small sections. The next division to be put under contract will also be about 35 miles, bringing the road to Adrian, Mich.

Mexican Central.—The company has awarded the contract of building the Guadalajara extension to Ameca, a distance of 50 miles, to J. H. Hampson, President and General Manager of the Mexico, Cuernavaca & Pacific road. Fifteen cars of the construction outfit are en route from El Paso to Guadalajara. Work will be pushed vigorously forward with the intention of inaugurating traffic on the new line by June 1, 1896. When the rails reach Ameca there will only remain a short distance to cover with track in order to reach the Pacific Ocean.

Mexican International.—Civil Engineer Kilbrew is now surveying between Guadalajara and Durango, Mex., and has been in the field some months past, locating the most feasible route for a road between those two cities. It is understood the general officers now en route to Guadalajara go there for the purpose of inspecting the surveys. If the route is approved it is likely that work will be commenced without much delay.

Muskegon Terminal.—F. H. Golbrook, of Muskegon, Mich., Secretary of this company, has issued a notice of the stockholders' meeting to be held at Muskegon on Dec. 10, at which the stockholders will be requested to authorize an increase of the capital stock to $1,050,000, and an issue of bonds amounting to $2,000,000. In addition to the road proposed to be built by the company it is intended to put on steam transfer boats across Lake Michigan from the western terminus of the company's road to Milwaukee.

New Roads.—Emmet H. Scott, Edward F. Michael and R. E. Morrison, of Laporte, Ind., representing a firm of lumbermen, have commenced the construction of a road 80 miles in length in Alger and Schoolcraft Counties in northern Michigan. The road starts at a point on South Bay, and will be built to Munising, Schoolcraft County, connection to be made with the Chicago & Northwestern and the Deluth, South Shore & Atlantic. This syndicate now owns 200,000 acres of pine lands in northern Michigan. Ten miles of the railroad have been completed, and the entire line will be ready for operation early next year.

Northern Pacific.—It is announced that Receiver Burleigh proposes to complete the extension to Lewiston, Idaho, undertaken some years ago, as soon as he secures the required authority from the United States Court. This extension will complete the branch undertaken some years ago by the Northern Pacific, but which was not completed beyond Juliette. This extension begins at the town of Pullman, which is on the Spokane & Palouse branch, extending south from near Spokane, and extends across the Idaho line to Moscow and Juliette. Only a few miles of road will be necessary to complete the road into Lewiston, which is the most important town in that portion of the State. The construction work will be heavy and the expense of building considerable, which has been the chief cause for delaying the completion of the line so long. The opening to settlement of the Nez Perces Indian Reservation near Lewiston probably accounts in a large measure for the decision to undertake the early completion of this branch.

Pickens & Addison.—The work of grading this line, which is to be a narrow gage road from Pickens, the terminus of the Buckhannon River branch of the West Virginia & Pittsburgh, to Addison, the county seat of Webster County, W. Va., is progressing rapidly, and will be ready for the track layers before many weeks. It is not expected that the road will be opened for traffic before early spring, when the travel to the Webster Sulphur Springs begins.

Pittsburgh & Eastern.—Work on the new road is progressing rapidly. The grading from Mehaffey to Summit, Pa., is completed and the company expects to have 15 miles of roadbed finished by January. Work on the Susquehanna River division from Burnside to Spaugh, a distance of 18 miles, will be begun shortly and pushed to completion by early spring.

Queen Anne's.—President W.H. Bosley, accompanied by Chief Engineer I. W. Troxell and Messrs. Frank Ehlen, of Baltimore, and Wilmer Emory, of Centreville, directors in this new road, are making a carriage trip over the route through Maryland, from Chesapeake Bay to Delaware and Lewes, on the Atlantic coast.

An issue of $1,440,000 of 5 per cent. bonds has been decided upon by the directors of the road. This is at the rate of $12,000 a mile. The bonds for the present will be held in the treasury of the company. Cash subscriptions by the stockholders have supplied sufficient funds for carrying forward the work of construction.

All rights of way on the first section of the road from Queenstown to Denton have been secured, and this portion is to be completed and ready for operation by April 1, 1896. From Denton to Lewes two routes are under consideration. The engineers have completed the locating of the northern route from Denton to Ellendale, Del., which is 15 miles from Lewes. The second route, from Denton, via Smithville, Bridgeville and Georgetown, is yet to be located.

Southern—Capt. John A. Dodson, Roadmaster, tells a correspondent in North Carolina that new rails will be laid the whole distance of the line between Charlotte, N. C., and Alexandria, Va., by Christmas next, except about 20 miles, and that those 20 miles will be replaced by heavy rails early in the spring. This programme includes new rails for the North Carolina road between Charlotte and Greensboro, N. C., on the Piedmont Air Line or old Richmond & Danville road from Greensboro, N. C., to Danville, Va., and on all of the Virginia Midland road, extending from Danville to Alexandria. On the North Carolina and Piedmont Air Line roads, Captain Dodson says the rails will be 75-lb. sections while those for the Virginia Midland road will weigh 85 lbs. This will give the North Carolina road (now virtually owned by the company, it having a lease on it for 99 years) new heavy rails from Charlotte, via Greensboro, to Raleigh and Selma, N. C., the whole length of the line, except less than 20 miles from Selma to Goldsboro. The new rails from Greensboro to Selma are now being put down, this part of the road forming the main line of the new route to Norfolk, Va. The Southern's line between Atlanta and Washington will then be unsurpassed anywhere in the South, both as to roadbed and equipment. The travel on this line at present is said by officials to be unprecedented.

Ste. Emelie & St. Gabriel.—Raoul Rinfret, of Montreal, engineer of this road, has just completed the surveys for a line from Ste. Emelie, east to St. Gabriel, P. Quebec, a distance of about 15 miles. The line connects at the latter point with the Canadian Pacific, about 70 miles from Montreal. The company has applied to the Quebec Provincial Legislature for incorporation and the usual subsidy which it is expected will be granted. If the subsidies are granted it is said that contracts for constructing the road will be let next summer. The grades will be 104 ft. to the mile and the maximum curvature will be 18 degs. There will be two bridges not over 20 ft. in length, each.

St. Louis & Oklahoma.—Chief Engineer P. G. Burns, of this road, projected from the St. Louis & San Francisco, at Sapulpa, in the Indian Territory, south-west through Oklahoma, started the survey to that city last week with a party of engineers from Oklahoma City.

Timson & Carthage.—Work on the new road from Timson, in Shelby County, Tex., to Carthage, is being pushed and tracklaying will begin soon.

Virginias.—This company, formerly the Columbus, Huntington & Guyandotte, and which is to build a line from Huntington, W. Va., to the Virginia state line by way of the Guyandotte Valley, has begun work on the surveys. The line from the mouth of the Guyandotte River to Pineville, W. Va., was surveyed in 1889, and there will be but little to do on that section. The road from Pineville to the Virginia line will be gone over, if possible, before the cold weather of the late winter sets in.

West Virginia Central & Pittsburgh.—At the annual meeting, held in Baltimore recently, the building of an extension of the line from Cumberland to Hagerstown, Md., was given more attention than any other matter up for discussion. President Davis has issued a special report to the stockholders, covering various points, and among the ones discussed at length is the building of this line. Among other things the report says: "The line has been thoroughly surveyed, considerable right of way secured, and the project is in such shape that active operations for its fulfillment could be entered upon any time that the conditions are deemed favorable. A contract has been made with the Pennsylvania and Cumberland Valley roads in which they agree to prorate on favorable terms with the Baltimore & Cumberland (the name under which the new road is incorporated) and to receive five per cent. of the gross revenue derived from the interchange of traffic with that road, to be applied, if necessary, toward the payment of the interest on bonds." It is known that additional surveys and locations have been made within the past few weeks along the line, which was originally laid out for the Baltimore & Cumberland road. Reports are to the effect that the coal and lumber business along the West Virginia Central & Pittsburgh are seriously hampered by the inability of that company to properly handle the freight offered, with its present facilities, beyond its own terminus.

West Virginia Southern.—The difficulties about right of way which this company has been contending with for several months have been amicably adjusted, and the building of the road will be completed within the next two months. The road is to run from a connection with the Chesapeake & Ohio, and the Kanawha River, at Brownstown, 10 miles from Charleston, W. Va., up Lens Creek, 20 miles, to the coal fields of the Lens Creek region. The road was organized several years ago as the Coal River Railroad, but nothing came of it on account of the depression of three years ago. It was reorganized about a year ago with Robert T. Herndon, of Charleston, W. Va., as President, and work on the line was begun at once. All the right of way was secured except a piece about a mile and a half in length, through the Gould & Parker lands, about midway of the line, and suits were instituted. Last week an amicable settlement was effected, and the right of way secured. In the meantime, the company had completed the grading throughout the length of the line, except the piece which was under controversy, and from the Chesapeake & Ohio to that point the track had been completed, and material trains put on. A big force went to work on the right of way through the Gould & Parker lands last week, and the entire road will be immediately completed. The territory to be opened is underlaid with Cedar Grove, Winifrede and Black Band coal seams, and is heavily timbered. Already four coal companies have been formed and have men at work building tipples for getting the coal to the railroad.

Electric Railroad Construction.

Akron, O.—The Akron, Bedford & Cleveland Railroad is now completed from Akron to Cleveland, 35 miles, having traffic arrangements with the Akron Street Railroad to run over its line into the center of Akron, a distrnce of 4 miles, and with the Cleveland Electric Railroad to the center of Cleveland, a distance of 5 miles. About 11½ miles is on private right of way owned in fee, 16 miles on the highway with 11 miles perpetual franchise and 5 miles 25-year franchise. The road is built in a first-class manner, and has steel bridges, heavy rails, mostly T, and is well ballasted; has at present an equipment of 14 cars of the large pattern, with two 50 H. P. motors under each car.

The old Akron & Cleveland Electric Railroad, which two years ago secured franchises from Akron to Cleveland via Richfield, has been amalgamated with the Akron & Cuyahoga Falls Rapid Transit Co., and work on the line will be commenced at once.

Albion, Ind.—The Commissioners of Noble County and the council granted a franchise recently to the Huntington, Columbia City & Ligonier electric road and gave the company the right of way on the public highways and streets. It is expected that work will commence on the project in the spring and be completed within a year.

Baltimore, Md.—About 11 miles of track have been laid on the Baltimore end of the Columbia & Maryland Railway, the boulevard electric line between Baltimore and Washington. Bids were opened November 20 for furnishing complete power plants for two of the stations to be built by the company. One of these will be erected near Hyattsville and the other near the Patapsco River. Plans for the buildings are being prepared. The specifications for the power plants require that they shall be completed within four months.

Boston, Mass.—A new electric street railroad is being projected to run from Newton Center to Boston. The proposed road will at first be built from Newton Center to Brookline.

Cairo, N. Y.—The Catskill, Cairo & Windham Street Railroad Company has been incorporated to construct a street railroad about ten miles in length in Greene County, from the Long Dock at Catskill Landing on the Hudson River to the village of Cairo.

Chicago.—An ordinance was recently passed allowing the Chicago City Railway Co. to build an electric road along Clark street to Washington, and also one granting additional franchises to what is known as the Calumet Electric line. The latter covers nearly all the streets in the extreme south end of the city.

Lancaster, Pa.—Farmers and citizens in the neighborhood of Cochranville have subscribed $14,000 and given rights of way for the proposed electric railroad from Philadelphia to Lancaster via Cochranville. A branch will be constructed to Oxford.

Langhorne, Pa.—The Newtown, Langhorne & Bristol Street Railroad has awarded the contract for the construction of an electric line 1¼ miles long, from Langhorne Station on the P. & R., through the boroughs of Langhorne Manor and Langhorne to the station on Trenton Cut-off. Work will be commenced at once, and when completed will be the first electric line in Bucks County.

New York City.—The Third Avenue Railroad Co. acquired, last week, the right to extend its lines through the northern part of New York City to the city's limits at Yonkers. The franchise for this is known as the Kingsbridge route, and for some time past both the Metropolitan Traction Co. and the Third Avenue Co. have been trying to obtain it. The Board of Aldermen authorized the building of railroads on those streets on which the Third Avenue Company proposed to build, declining to authorize the building of lines on those streets designated in a similar application of the Metropolitan Company. The franchises to build street railroads in New York are sold to the highest bidder at a public sale. A few days before the Kingsbridge franchise was to be sold the North End Co. was incorporated in the interest of the Metropolitan Co. That company bid against the Third Avenue Co. until a bid of 38½ per cent. of the gross earnings was made by the latter company. This is in addition to the statutory price of 3 per cent. of the gross earnings for the first five years, and 5 per cent. afterward. The proposed routes are from Kingsbridge road and West 162d street, along Kingsbridge road to and across the proposed new bridge over the Ship Canal, to and across the bridge over Spuyten Duyvil Creek to Broadway to the city line. Also from West 125th street, along St. Nicholas avenue to Manhattan avenue, to West 116th street. Also from Kingsbridge road along Riverdale avenue to the city line; and also from Manhattan street, along Eleventh avenue, or Boulevard, to Kingsbridge road, at or near 169th street. The present line of the Third Avenue Co. extends from the Post Office along the Bowery and Third avenue to the Harlem River, with a line diverging from this route west through 125th street to Amsterdam avenue, and along that avenue on the west side of the city to 190th street, about 11 miles in all. It will be seen that when the proposed routes are completed there will be a direct line of street railroad from the City Hall through the annexed district to Yonkers, a distance of nearly 15 miles.

The company proposes to use the cable system as far as 163d street, and above that point the overhead trolley, the use of which is allowed for 10 years.

At the expiration of that time it is presumed that an underground system will be so perfected as to make its adoption desirable. No plans for the construction of the road have as yet been made, as the consent of the property owners must be first obtained, and it is probable

that work on the road will not be begun before next spring.

Pottstown, Pa.—The survey has been completed for the proposed electric road from Pottstown to West Chester, a distance of 26 miles.

Staten Island, N. Y.—Two lines of trolley roads, aggregating 25 miles, are in course of construction here, and as much more is planned to be built within two years.

St. Louis, Mo.—It is said that the line of the Fourth Street and Arsenal Street Railroad is to be extended and put in working operation by March 1 next. It will be an overhead trolley line all the way through.

Washington, D. C.—The directors of the District of Columbia Suburban Electric Railway will apply to the incoming Congress for a charter for the District of Columbia portion of the road. The route of the proposed road was established last year. It begins at Fifteenth and H streets northeast, Washington, and follows the Washington and Baltimore pike road, running through Bladensburg and Hyattsville as far as the Baltimore & Ohio statian at the latter place, and thence to its terminus at Riverdale Park.

Watkins, N. Y.—The directors of the Watkins & Havana Company have decided to continue the proposed electric road from Havana to Horseheads, to connect with the Elmira & Horseheads Road.

GENERAL RAILROAD NEWS.

Baltimore & Ohio.—The company reports earnings for the year ending June 30 as follows:

	1895.	1894.	1893.
Gross earn	$22,871,182	$ 2,502,662	$26.214,807
Oper. exp	15,801.013	15,560,689	19,041,981
Net earn	$7,016.138	$6,941.973	$7,172,875
Other income	1,627,595	1,982 857	2,251.377
Total incomes	$8,643,733	$8.924,830	$9.424,202
Fixed charges	6,934,052	6,727.583	6,910,762
Balance	$1.709,681	$2,197 248	$2,513.440
Dividends	300.000	924,935	924,022
Surplus	$1,409,681	$1,272,313	$1,588.518
Car trusts and betterments	770,164	60,346	759,711
Surplus	$639,517	$511,967	$828,8 7

Boston & Albany.—The company reports its earnings as follows for the quarter ending Sept. 30:

	1895.	1894.	Inc. or dec.
Gross earn	$2.49 .049	$2,330,354	I. $159,695
Oper. exp	1,520,909	1,467,392	I. 53,517
Net earn	$9?9.140	$862,932	I. $106,178
Fixed charges	142,339	172,618	D. 30,279
Surplus	$826,801	$630,344	I. $136,457

Central Washington.—It appears that this road is to be operated as an independent line, indicating that the report a few weeks ago, that a new lease had been made with the Northern Pacific, was premature. As recently stated, the company operates 110 miles of road in the Big Bend wheat growing district in Eastern Washington. Since its opening the line has been operated by the Northern Pacific, the construction of the road being undertaken to give that company new connections in the wheat district of the Upper Columbia. Some months ago certain of the security holders brought proceedings in the United States Circuit Court on the ground that the terms of the lease were onerous to the Central Washington. Judge Hanford upheld their contention and authorized Receiver Chamberlain to cancel the lease and to operate the road independently or to make a new lease with more favorable terms, as he deemed best. Receiver Chamberlain thinks that the outlook for the success of the road under independent operation is very hopeful. The acreage of wheat in the district reached by the line is double the acreage planted last year. He thinks that the freight to be hauled this fall will tax to the utmost any facilities the road can provide. So far only about 30 per cent. of the crop grown this year has been shipped, so that the Receiver, in assuming the direct operation of the road at this time, takes over the property when the traffic is heaviest.

Cleveland, Cincinnati, Chicago & St. Louis.—The freight terminals now being built by the railroad in Louisville are nearly completed, and it is expected that they will be far enough advanced by Dec. 15 to make possible the opening of the Louisville line for freight service by that date. The company gets a Louisville line by using the Baltimore & Ohio Southwestern tracks from North Vernon, Ind., a town about 57 miles north of Louisville. It will be remembered that the contract for the use of this track was made by the company early in the year after surveys had been made by the company's engineer for a new route to the Ohio River from North Vernon.

Denison & Northern.—Moran Scott was last week appointed Receiver by Judge Kilgore in the United States Court at Ardmore, I. T. This road is a partially built line north of Denison, Tex., into Indian Territory, and has been under construction for several years.

Erie.—This company has been incorporated in New York, as the successor of the New York, Lake Erie & Western. The capital of the new company is $30,000,000 of four per cent. first preferred stock, $16,000,000 of four per cent. second preferred stock; $100,000,000 common stock, and the company is authorized to create a mortgage to secure $35,000,000 prior lien bonds and $140,000,000 general lien bonds, all in accordance with the plan of reorganization. All classes of stock of the reorganized company are to be vested in voting trustees, subject to the terms and conditions set forth in the plan of reorganization. The new company will own and operate not only the Erie lines, but also the line of the New York, Pennsylvania & Ohio and Chicago & Erie, constituting a through line from New York to Chicago, with branches to the coal regions in Pennsylvania, the Mahoning Valley and elsewhere, in all about 2,000 miles of railroad. Various details in connection with the acquisition of the New York, Pennsylvania & Ohio and Chicago & Erie have yet to be carried out, but they are of a formal character, and from Dec. 1 the new company will operate all the property.

The incorporation tax of the new company was $182,500.

Great Northern.—Judge Kelly, of the Minnesota District Court, at St. Paul, announced his decision, Nov. 16, granting the injunction restraining the proposed agreement for a guarantee of the Northern Pacific securities by the Great Northern. This suit was brought some months ago by the State Attorney General. A former suit by a stockholder of the company, was decided in favor of the constitutionality of the proposed agreement, by Judge Sanborn, of the United States Court.

Green Bay, Winona & St. Paul.—The attorney of the Farmers' Loan & Trust Company, of New York, applied for a decree of sale in the United States Court at Milwaukee this week. Henry Crawford, of Chicago, represented the first mortgage bondholders, and moved for the removal of the trustees, the Farmers' Loan & Trust Company, of New York, and to change the receivership No decision was given.

Meriden, Waterbury & Connecticut River.—A new Board of Directors was elected last week, the majority members being directors or officers of the New York, New Haven & Hartford. The road was a leased line of the New England, and some interest was attached to the question as to what disposition the New Haven Company would make of it. The line operates about 30 miles from Waterbury through Meriden to the Connecticut River, near the town of Cromwell. The line was built about six years ago by a local company, most of the stock being held by manufacturers in Meriden or along the line of the road. The company soon became bankrupt, and was finally leased by the New England after most of the indebtedness of the old corporation had been canceled.

New York, New Haven & Hartford.—The earnings of the company for the three months ending Sept. 30, are reported as follows:

	1895.	1894.	Increase.
Gross earn	$8 322,256	$7.237,015	$1,085,241
Oper. exp	5,023,953	4 485,716	538,237
Net earn	$3,298 303	$2,751, 99	$547 004
Other income	63,545	22.662	40,883
Total income	$3,861,848	$2,773,961	$887,887
Fixed charges	1,573,334	1,378,453	194,881
Surplus	$1,788,514	$1,395,508	$393 006

Cash on hand, $1,291,262, and profit and loss surplus, $4,511,529.

Norfolk & Western.—Judge Taft, of the United States Court at Cincinnati, has appointed Henry Fink Receiver of the road, on petition of the Mercantile Trust Co. of New York, holding $16,000,000 of mortgage bonds. Mr. Fink had already been appointed Receiver for the Fidelity Trust Co. of Philadelphia, trustee of other mortgage bonds.

Northern Pacific.—The earnings for the three months to Sept. 30, were as follows:

	1895.	1894.	Inc.
Gross earn	$5.586.924	$4,743.002	$843,921
Oper. exp	3,051,949	2,896,464	155,485
Net earn	$2 534,974	1,846,558	$688 436
Gross income	2,634 442	1,971.238	663.203
Rentals, taxes, etc	510,090	485,663	24.486
Net income	$2,124,351	$1,485.635	$638,716

North Pennsylvania.—Arrangements have been made for refunding the seven per cent. mortgage loan due in May, 1896. The loan is $1,500,000, and the new rate of interest will be four per cent., affecting an annual saving of $45,000 in interest payments.

Southwestern of Georgia.—This road has been leased to the Central of Georgia in perpetuity at 5 per cent. on the stock, from Nov. 1. Provision is made for the expense of maintaining a corporate organization, so that the 5 per cent. will be net to the stockholders. The lessee also pays the defaulted rental, so that the company will receive 5 per cent. from July 1, 1892, to November, 1895, amounting to $865,183. The money is expected to be received during the present year, upon which a dividend of 10 per cent. will be paid to the stockholders. About $270,000 will be required to cover the expenses, fees and compensation accompanying the negotiations which have brought about the lease. The remaining sum, about $75,000, will be held against future contingencies. The Southwestern Company is relieved from all liability in connection with the tripartite bonds and from its endorsements upon the bonds of the Montgomery & Eufaula Co., thus leaving it entirely free from debt.

St. Lawrence & Adirondack.—Articles of consolidation of the Malone & St. Lawrence with this company were filed in Albany, N. Y., on Nov. 18. The directors are William Seward Webb, Chauncey M. Depew, Edgar Van Etten, John Jacob Astor, Frank G. Smith, Charles H. Burnett and Henry L. Sprague, of New York; Martin E. M. Clary, of Malone, and Edward C. Smith, of St. Albans, Vt. The Malone & St. Lawrence was the division between Malone, New York and the Canadian line.

St. Louis, Belleville & Southern.—This road was sold at foreclosure recently for $500,000 to the representatives of the mining companies owning the coal mines in the Belleville district of Illinois, which are reached by the road. There seems to be no foundation to the newspaper talk that the line had been purchased by the Illinois Central and would be used by that company to give it a new entrance to East St. Louis instead of using the tracks of the Cairo Short Line as at present. The new road extends from East St. Louis to Belleville, about 10 miles, and was built a year or so ago, but has never been put in complete operation. The road extends through valuable coal mines and, as stated above, the controlling interests in the two properties are nearly identical. Various improvements will now be made and the line operated its entire length, with W. J. Karner, of St. Louis, as General Manager.

Electric Railroad News.

Brooklyn, N. Y.—The property of the Long Island Traction Company is advertised to be sold at auction on Dec. 5. It is thought, however, that the sale may be prevented.

Chicago.—Marcus C. Gormley has filed a bill in the Circuit Court for a receiver for the assets and franchises of the General Electric Street Railway Co. and also to cancel a quantity of stock which he says has been issued to various persons.

Goshen, Ind.—The Indiana Electric Railroad Co., operating a street railroad in this city and Elkhart, has executed a mortgage for $500,000 in favor of the Royal Trust Co. of Chicago. The money will be used in the construction of an inter-urban line between the two cities.

New Britain, Conn.—It is reported that negotiations are in progress for the acquisition by the New Haven Railroad Company of the property of the Central Railway and Electric Company of New Britain. The company owns an electric light plant at New Britain and about 15 miles of track, of which about two-thirds parallels either the New Haven or the New England road, and it is seeking the right to push through a new line paralleling both lines to Hartford, eight miles away.

TRAFFIC.

Traffic Notes.

The Delaware, Lackawanna & Western has made an arrangement for the checking of baggage to and from residences in the large cities on its line, at the usual rate.

The steamer El Norte, of the Morgan Line, carrying freight between New York and New Orleans, made the trip last week from Sandy Hook to South Pass in 4 days 4 hours 56 minutes.

The Seaboard Air Line has been running excursions to the Atlanta Exposition at very low rates, the round trip fare from Norfolk being $5. Similar rates were made from other places north of Abbeville, S. C. From many places these tickets cost less than five mills a mile, and trainloads of 1,000 passengers were taken. The tickets are limited to ten days.

The New York State canals will be closed on December 5, unless sooner closed by ice Last week many boats were delayed at Buffalo by low water and grain shippers were put to much inconvenience, the elevators being crowded and many boats arriving on the lake. It is said that the use of water from the canal by the factories at Lockport was the cause of the trouble in the canal.

The Milk Producers' Association, composed of shippers west of the Hudson River, and others sending to New York City, have complained of the railroad rates, and the Interstate Commerce Commission held hearings in New York City this week. The complaint is aimed chiefly at the group rates, by which shippers near New York have to pay as high as those at more distant points.

Chicago Traffic Matters.

CHICAGO, Nov. 20, 1895.

The general passenger agents have not yet perfected an agreement to cover trans-Missouri traffic. Some of the lines desire to include all trans-continental business, while the Union Pacific objects to including business beyond Colorado until all the trans-continental lines are willing to join the Association. The interested lines have decided to go ahead with the new Association (covering business east of the Missouri River), and a meeting was held yesterday at which Mr. B. D. Caldwell was elected Chairman. The Illinois Central has joined the new Association, and the agreement becomes effective Dec. 1.

A satisfactory arrangement has been made with the Canadian Pacific and Grand Trunk regarding the division of immigrant business, and these lines will work in harmony with the Western lines in the control of this business through the Clearing House. There is a disagreement between the Southern Pacific and the other lines over this business. The other lines accuse the Southern Pacific of influencing business from New York via New Orleans through collusion with some of the steamship immigrant agents. This the Southern Pacific denies.

The Chicago roads have decided to meet any freight rates that may be made by the Southern Pacific between San Francisco and Utah common points, and to protect Utah Territory against any encroachment from the West. Utah has hitherto been considered to belong to the Eastern lines, and not until recently has the Southern Pacific made any attempt to control it. The recent decision of that road to make rates to and from that territory competitive with those made from the East, is likely to cause considerable trouble before an agreement is reached if the Southern Pacific persists in its course.

The roads interested in Colorado freight traffic have formed the "Colorado Railroad Association," and have agreed upon an advance in rates to this territory, with arrangements for controlling the business through a chairman at Denver. Mr. P. J. Flynn has been elected chairman.

The action of the Santa Fe in putting on a new fast train to California has resulted in all the lines via Omaha and Ogden shortening their schedules. The Northwestern train leaves Chicago at 6 o'clock p. m., and reaches San Francisco at 8:45 p. m. the third day. The Burlington, the Milwaukee & St. Paul and the Rock Island have shortened their schedules between Chicago and Omaha, so as to make connections with the "overland" on the new schedule.

The Rock Island has been making additions to its Chicago suburban service, which materially improve it.

After Dec. 1 the Western roads will make a charge for carrying bicycles in baggage cars. The weight of bicycles, tricycles and baby carriages is to be estimated at 50 lbs. and charges are to be based on the excess baggage scale, with a minimum of 25 cents.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending Nov. 16, amounted to 76,444 tons, against 80,008 tons during the preceding week, a decrease of 3,564 tons. The proportions carried by each road were:

Roads.	Week to Nov. 16.		Week to Nov. 9.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central	11,457	15.0	9,970	12.4
Wabash	6,796	8.9	7,001	8.8
Lake Shore & Mich. South.	12,775	16.8	12,964	15.1
Pitts., Ft. Wayne & Chicago	8,281	10.9	9,730	12.2
Pitts. Cin., Chi. & St. Louis.	7,905	10.4	9,006	11.3
Baltimore & Ohio	4,704	6 2	4,652	5.8
Chicago & Grand Trunk	8,149	10.7	7,783	9.7
New York, Chic. & St. Louis	6,112	8.0	5,965	7.4
Chicago & Erie	6,967	9.0	10.373	13.0
C., C., C. & St. Louis	3,198	4.1	3,464	4.3
Totals	76,444	100.0	80,(08	100.0

Of the above shipments 3,122 tons were flour, 39,379 tons grain and mill stuff, 13,869 tons cured meats, 9,216 tons dressed beef, 1,211 tons butter, 1,829 tons hides, and 4,613 tons lumber. The three Vanderbilt lines carried 398. per cent.; the two Pennsylvania lines 21.3 per cent.

The Stock Yards Switching Charge Case.

The Illinois Railroad Commissioners have announced their intention of proceeding against the Chicago & Alton for failure to observe the order of the Board directing the road to stop charging $2 a car for delivering live stock to the Union Stock Yards, Chicago. It is given out by the Chairman of the Board that the action will be an action in debt. The penalty for making extortionate railroad charges is very heavy. It is probable that no other suits will be commenced at present, but that suit against the Alton will be considered a test suit and will be carried to the Supreme Courts.